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THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1911

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has already begun in the case of Volumes I to XIV inclusive, and the other volumes (XV to XXIX) are in the binders' hands. Complete publication of the Eleventh Edition of The Encyclopaedia Britannica will, therefore, be effected soon after this magazine is in the hands of its readers. The sale has been so extremely successful that in order to allow all who wish to purchase the book an opportunity of obtaining it on the most favourable terms possible, it has been decided to allow the present low prices to remain open till May 31st next. The first printing of 17,000 sets—12,000 on India paper and 5,000 on Ordinary paper—(which it is expected will be finished by March 1st) will, in respect of the India paper, be over-sold by the time this advertisement is read; so that those who do not order promptly will find their names far down on the list of subscribers to whom deliveries will be made in impartial rotation from the further stock of sets which has been put in hand.

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P. T. O.

XUM

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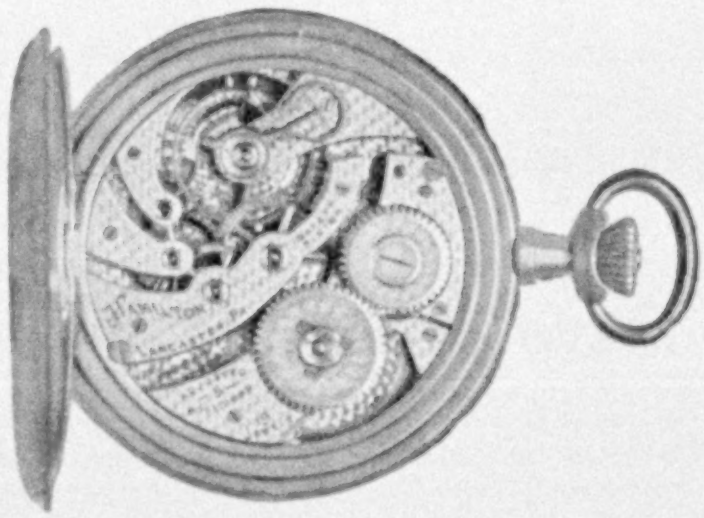

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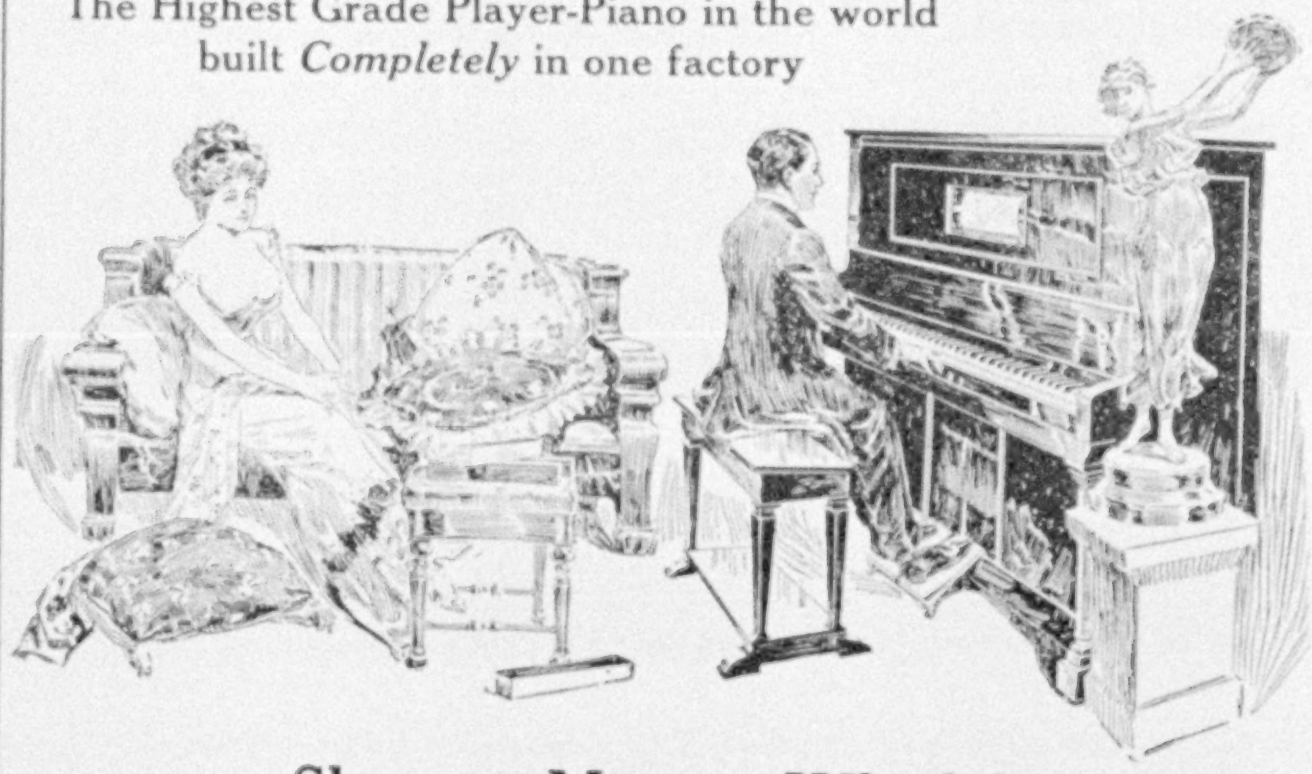

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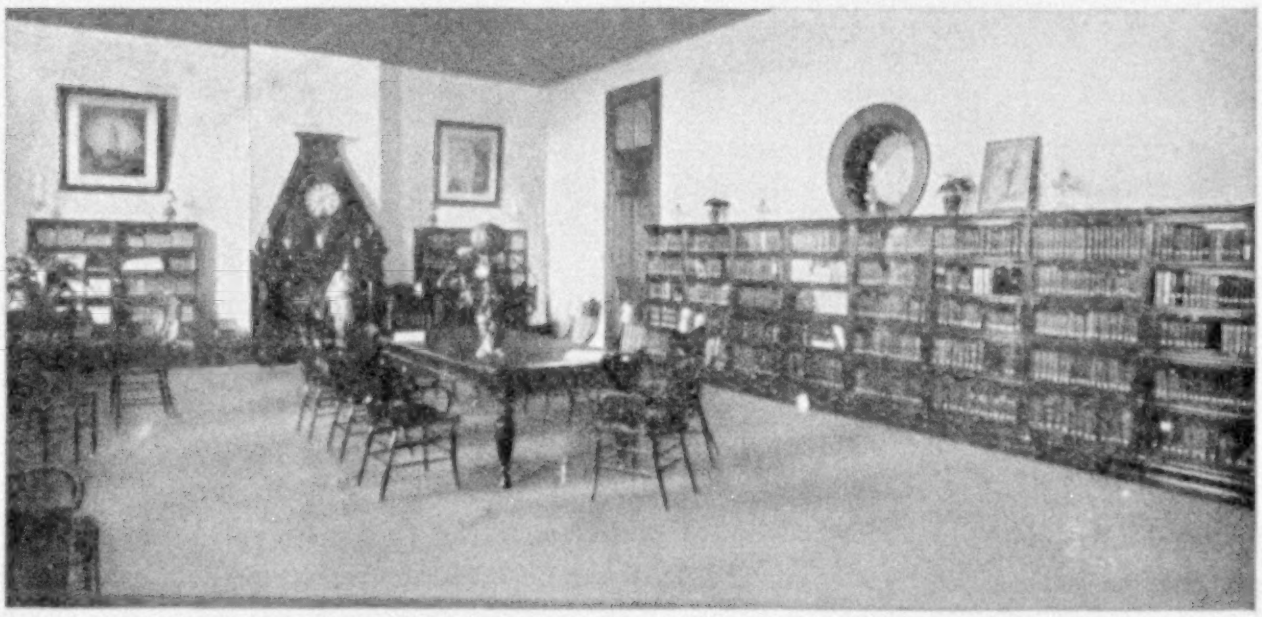

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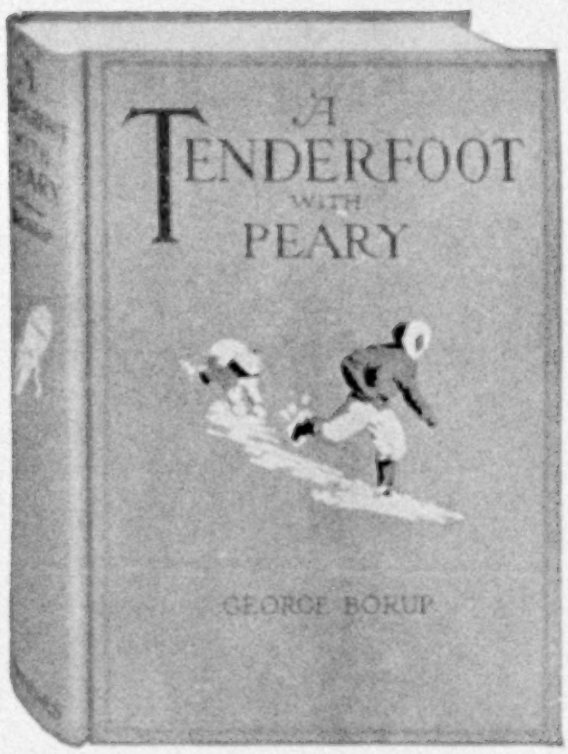

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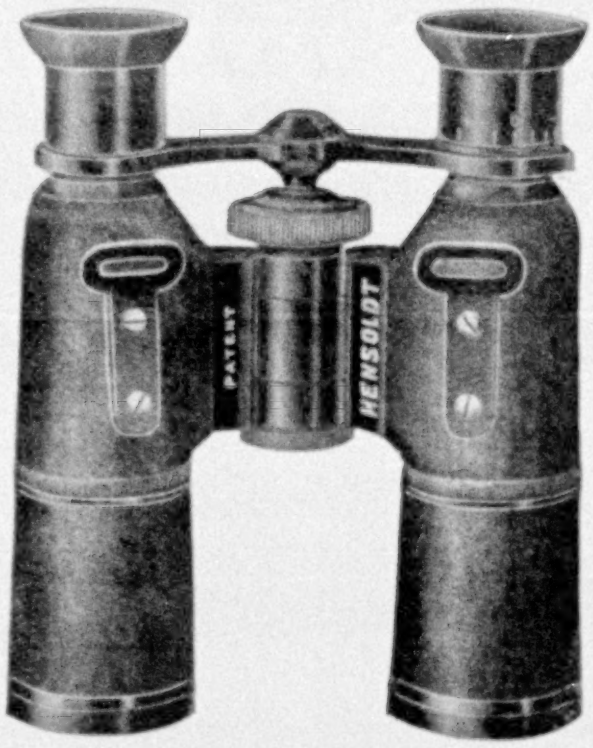

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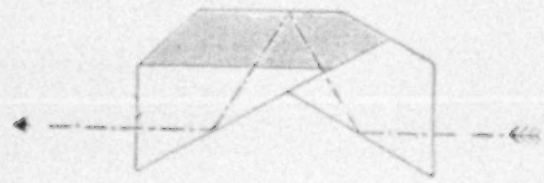

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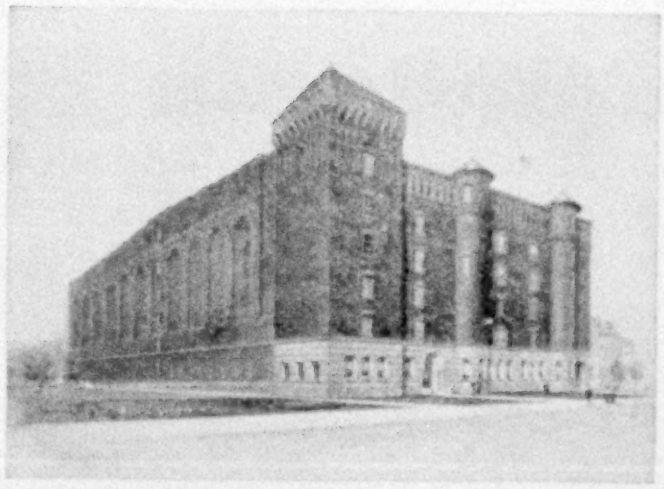

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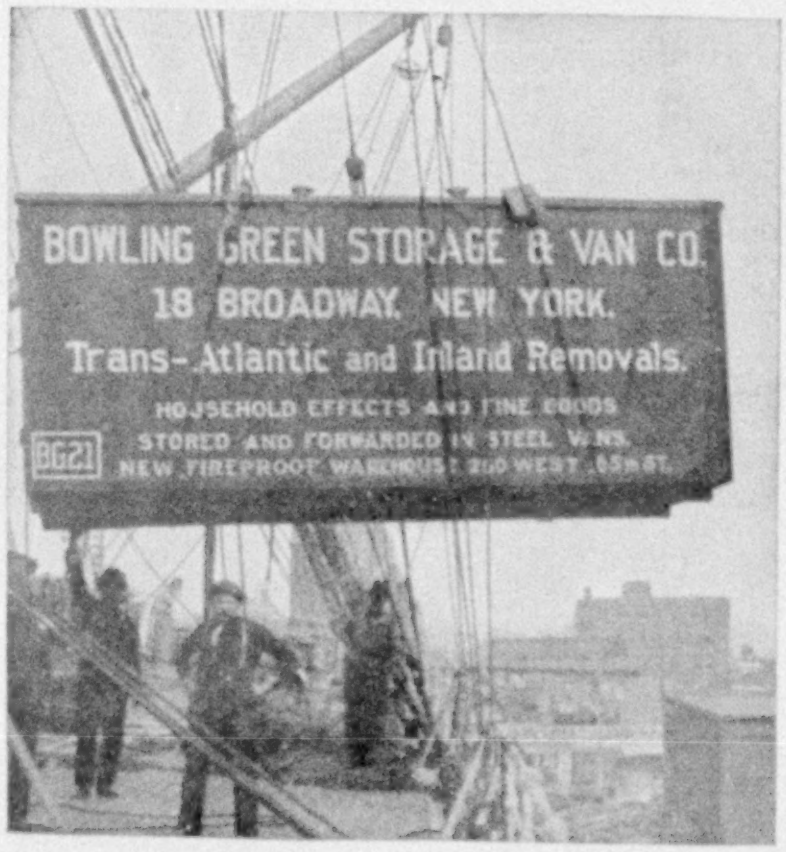
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VOL. XXII, No. 3 WASHINGTON MARCH, 1911

THE NATIONAL GEOGRAPHIC MAGAZINE

FIELD SPORTS AMONG THE WILD MEN OF NORTHERN LUZON

By Dean C. Worcester
Secretary of the Interior of the Philippine Islands

With Photographs by the Author

MY acquaintance with the wild men of northern Luzon began in July, 1900, shortly after the arrival of the second Philippine Commission at Manila.

We now know that there are but seven non-Christian tribes in northern Luzon, namely, the Negritos, the Benguet-Lepanto Igorots, the Ilongots or Ibilaos, the Ifugaos, the Bontoc Igorots, the Kalingas, and the Tingians; but at that time no member of the Philippine Commission had any personal familiarity with the tribes of this region. My own previous travels had been limited to Marinduque, Mindoro, the Visayan Islands, Mindanao, and the Sulu, Tawi-Tawi, and Palawan groups. No other Commissioner had ever previously visited the Philippines. I was therefore forced to get my information concerning the non-Christian people of northern Luzon from the available literature, which was full of contradictions and obvious misstatements.

For instance, Fernando Blumentritt, whose extraordinarily incorrect statements relative to the non-Christian people of this region had at that time hardly been questioned, assigned to it a total of some 36 tribes, while the Jesuit priests at Manila, following Blumentritt for the most part, gave a total of 26.

In the general scheme of government for the Philippines, the control of all non-Christian tribes, except those of the Moro province, was assigned to the Secretary of the Interior. It also fell to my lot to draft such legislation as might be deemed necessary in the premises; and, in order that I might do this with an adequate knowledge of the facts and might exercise intelligently the somewhat arbitrary authority vested in me by law, it seemed to me necessary to visit the wild man at home, and to investigate conditions on the ground. I therefore began a series of trips which were at first limited to the territory over which the Spaniards had established some semblance of authority, but were gradually extended to previously unknown regions until I had familiarized myself with conditions throughout practically all of northern Luzon.

SKETCH MAP OF NORTHERN LUZON

These trips were at first made at my own discretion, but later the provinces largely populated by non-Christians were organized under the so-called Special Provincial Government Act, and the duty of visiting and inspecting each such province at least once during each fiscal year was imposed by law upon the Secretary of the Interior.

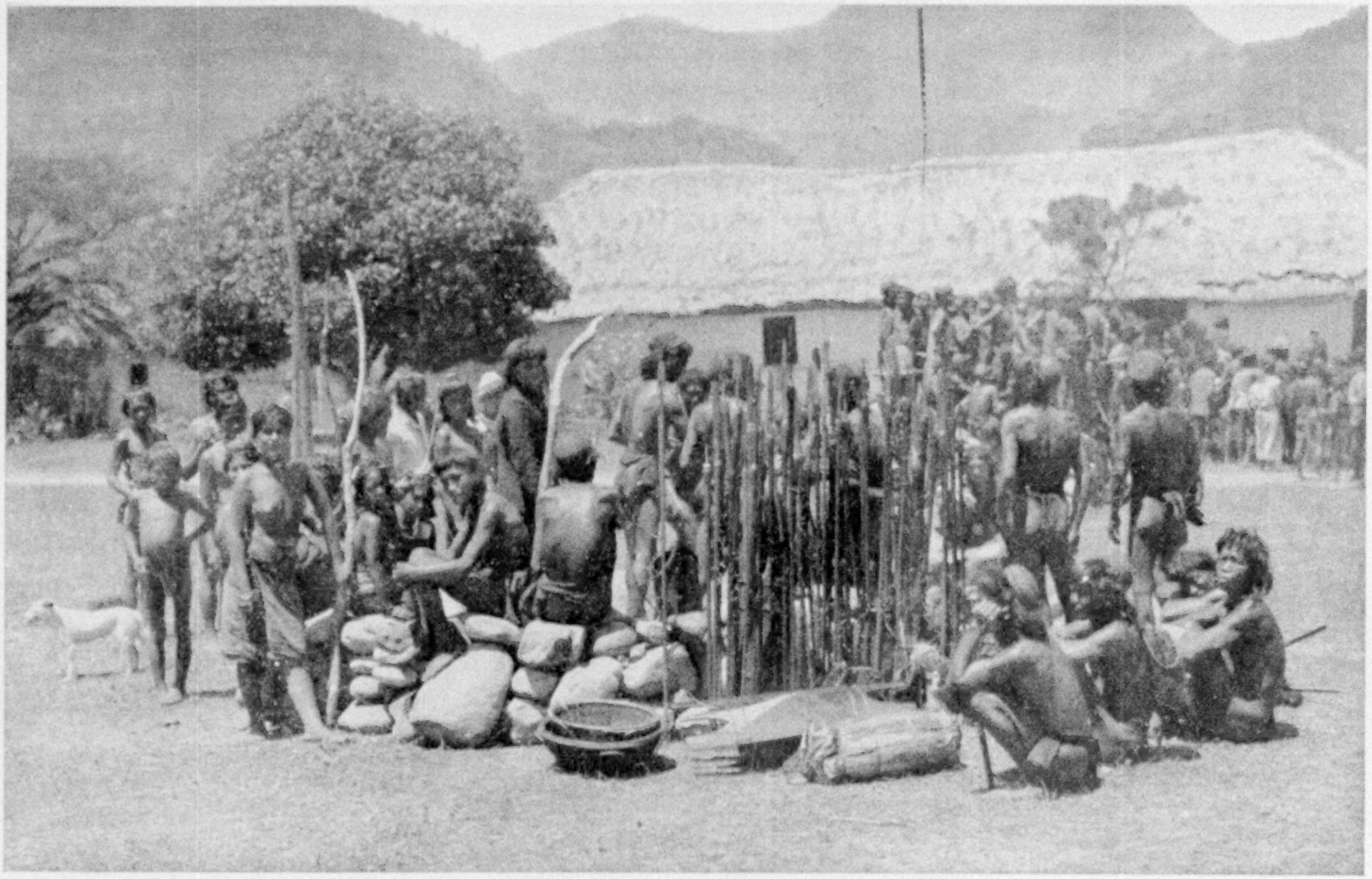
The number of wild men who assembled to meet me at important points was at first small, and the meetings held with them were very informal. The meetings are still informal, but the attendance now sometimes reaches 6,000 or 8,000. Opportunities are thus afforded to meet the headmen of entire subprovinces and amicably to discuss past occurrences and future plans. Gradually it has come to be understood that the feuds between hostile settlements must be forgotten at such gatherings. As a result there are often present delegations from settlements which have been fighting each other for years. When such people have once been brought into contact with each other it has often proved a comparatively simple matter to establish more or less permanent friendly relations between them.

It is obviously essential to maintain peace during the period of 24 to 48 hours while they are together. To do this and at the same time create just the right atmosphere to stimulate the frank and friendly discussion of any vexed questions which demand settlement, and the bringing about of friendly understandings between old enemies, requires no little tact and good judgment. On more than one occasion I have seen a thousand or more fighting men rush to arms and begin looking for trouble as the result of some occurrence which should have been of insignificant importance. Yet in the end good fortune has always attended us, and thus far no one has ever been killed, or wounded except by accident, while present at one of these gatherings.

NATIVES FOND OF INTOXICANTS

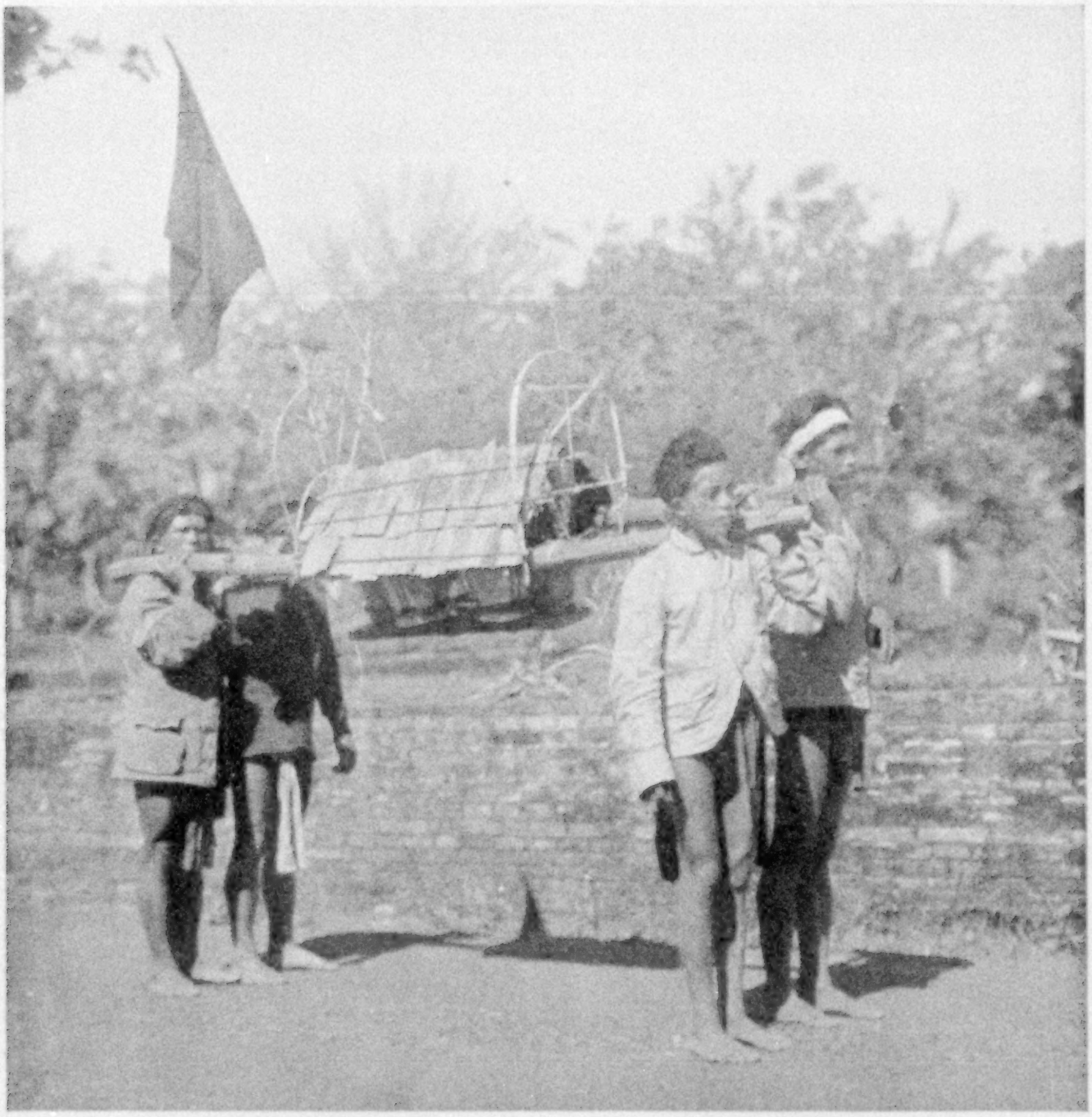
In achieving this very fortunate result, we have always been careful to see that there was plenty to eat *and not too much to drink!* The latter condition is not always easily maintained. Any one who knows the Christian Filipinos knows that the vice of alcoholism will never become common among them, but with the wild men the case is very different. Many of them are prone to overindulge in alcoholic stimulants; and, indeed, some of the tribes hardly considered it good form to leave a *fiesta* sober. At the outset the hillmen received the white man's firewater with enthusiasm and promptly got so drunk that the universe seemed to

AN IGOROT GATHERING LILIES NEAR THE TRAIL TO CERVANTES



IGOROTS FROM TUCUCAN VISITING AT THE TOWN OF BONTOC

The people of the latter place have recently taken a head from them, so, though they have come in to meet Secretary Worcester, they have brought their lances with them. Note the peculiar caps



LEPANTO IGOROTS BRINGING IN TAPUY: CERVANTES

Tapuy is a fermented drink made from rice. The old jars, probably of Chinese origin, in which it is kept, are very highly prized

reel around them, and they had to hang on to the grass in order to lie on the ground.

I secured the passage of a stringent law, which is effectively enforced, making it a criminal offense to sell or give to any member of a non-Christian tribe "any ardent spirits, ale, beer, wine, or intoxicating liquors of any kind, other than the so-called native wines and liquors which the members of such tribes have been accustomed themselves to make."

The native drinks are comparatively mild and innocuous, but there are never lacking those who are willing to make up for their lack of strength by guzzling them in large quantity. Furthermore, to guard against a possible shortage, due to what they consider the Americano's ultra-conservative ideas, they are very apt to bring their own drink with them to these

LEPANTO IGOROTS AT CERVANTES

They are dancing around unopened jars of *tapuy* to propitiate the "anitos," or spirits of the dead, and make it certain that the drink will have a proper effect on those who partake of it. The spectators are Filipinos.

gatherings. Indeed, an absolutely essential feature of the arrival of a deputation of Ifugaos is that the headmen should offer *bubud* to the American officials. A refusal to taste it would be interpreted as an act of hostility, and would throw cold water on all subsequent proceedings.

KEEPING THE HEAD-HUNTERS IN GOOD HUMOR

Apart from the all-important question of providing proper food and drink, it is highly essential that from the time the first delegations begin to arrive until the last have departed the crowd should be kept occupied and entertained in order that there may be no opportunity for ill-disposed persons to stir up mischief. To this end the fondness of the hillmen for field sports has been utilized with constantly increasing success.

Members of six of the northern Luzon tribes—namely, the Ilongots, the Ifugaos, the Kalingas, the Bontoc Igorots, the uncivilized Tingians of Apayao, and the Negritos of the east coast of northern Luzon—have until recently followed that wildest and most dangerous of all such sports, in which the reward of success is a gory human head and the penalty

THE "BIRD" DANCE: CERVANTES (SEE PAGE 222)

for lack of skill and alertness is that one furnishes such a prize to some one else.

It may seem flippant to call head-hunting a field sport, yet the hard fact is that it has been just that with many of the northern Luzon hillmen. Furthermore, the game has often been played with close observance of very stringent rules, under which bodies of picked men from hostile rancherias met at prearranged times and places and fought to a finish. More commonly, however, attacks were made from ambush and victims were outnumbered ten to one by their assailants.

It is needless to say that this particular form of sport, with its attendant train of cowardly and ghastly murders of women and children and of endless bloody feuds, has not been smiled upon by the American authorities. The effort to suppress it has been unexpectedly successful and head-hunting is rapidly becoming a thing of the past, but superabundant animal spirits will inevitably find an outlet, and in this case we have tried, with a good deal of success, to direct them into less turbulent channels by teaching them American athletic games and by encouraging their fondness for dancing.

All hillmen and most hill-women love to dance, and each tribe has its own peculiar dances. Indeed, there are special dances which are confined to single settlements or small groups of settlements. Feasting, music, and dancing have gone together since the world was young, and we have frankly encouraged the continuance of this good old custom.

I invite you to take a trip with me, in imagination, through northern Luzon, in order that you may see for yourselves the part which field sports are playing among the wild people of that region.

We leave Manila on a coast-guard boat and 24 hours later land through the surf at Tagudin, the capital of the subprovince of Amburayan. As this is a Christian town, and as the wild men prefer

to come to some point within their own territory to meet us, we have arranged that the Igorots of Amburayan should go to Cervantes, the capital of the neighboring subprovince, Lepanto.

Cervantes is reached after a horseback ride of 41 miles, in the course of which we climb upward through wonderful tropical forests until at the crest of the Malaya range we reach the pines and lilies of the temperate zone; we then descend its eastern slope, and as we approach our destination are met by a great gathering of Igorots on horseback and on foot, who escort us into town.

The plaza is already crowded and new delegations are constantly arriving, bringing with them their *tapuy*, a fermented drink made from rice. They are anxious to begin the *fiesta* and almost immediately open the *tapuy* jars and start the preliminary ceremonial dances necessary to insure the good-will of the spirits of the dead and to make it certain that the *tapuy* will have a proper effect on those who partake of it!

THE BIRD DANCE

Other dances of several kinds are soon in full swing. The commonest of these is the Benguet-Lepanto bird dance, the music for which is furnished by two long-barreled wooden drums with skin heads, two *gansas* or bronze timbrels, a stone, and a bit of iron and steel. Each drummer squats on the ground with the barrel of his drum held under his left arm. He beats its head with his open hands and gives considerable range to its really musical notes by fingering its head and by pressing on its barrel. The remaining musicians dance while they play. The *gansa* men beat their instruments with sticks, while the man with the steel and stone clicks them together.

The musicians dance around a circle of small diameter into which there presently steps a man with outstretched arms from which hang blankets reaching to the ground. He is supposed to represent a bird, and hops and swoops about in a peculiar fashion, occasionally letting his arms drop and walking by way of change. His advent is promptly followed by that of a woman, whose body is draped in a long blanket, which gives her much trouble by constantly slipping from her shoulders, often making it necessary for her to discontinue her dancing long enough to readjust it.

Her performance is usually stiff and ungraceful. All of the participants in the dance remain as solemn as if it were a religious ceremony.

The Lepanto Igorots also have a circle dance, which is invariably in evidence on festive occasions. Any number of persons of both sexes may take part in it. The men line up with their arms about each other's necks. The women form a similar line immediately back of them. The men sing and the women answer. The voices of the men are harsh and guttural. Those of the women are soft and musical. The lines soon begin to sway forward and back and then to move slowly to the right or to the left. The dancers sidestep and do a good deal of vigorous stamping. The two lines weave in and out, forming circles and straightening again, and the performance may continue for hours.

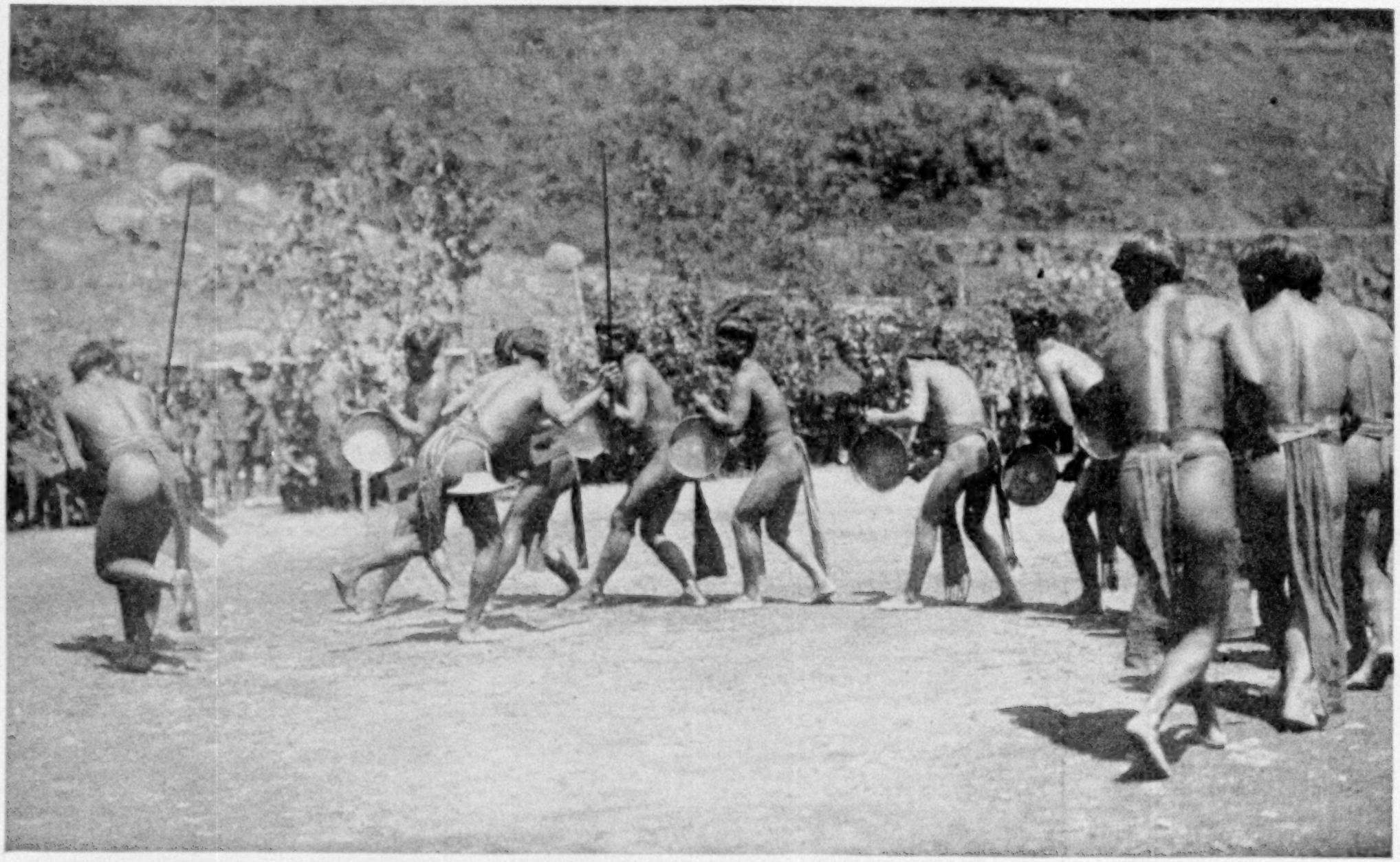
This circle dance is a much more cheerful performance than is the bird dance previously described. Shouts of laughter from the participants sometimes interrupt it. In the glare of the morning sun it looks prosaic enough, but when seen at night on some chilly, wind-swept hilltop, by the light of a blazing fire of pitch-pine, it becomes strangely attractive. One wishes that he could understand the words of the songs, which often obviously refer to him, but is forced to be content with watching the play of fire-light and shadow, listening to the strange harmonies of the barbaric music, and wondering what it is all about.

THE WILD DANCES OF BONTOC

Our next stop will be at Bontoc, 32 miles away, and for half that distance we climb steadily. As we leave Sagada, come out for a moment on the sky-line and begin the real descent to the Rio

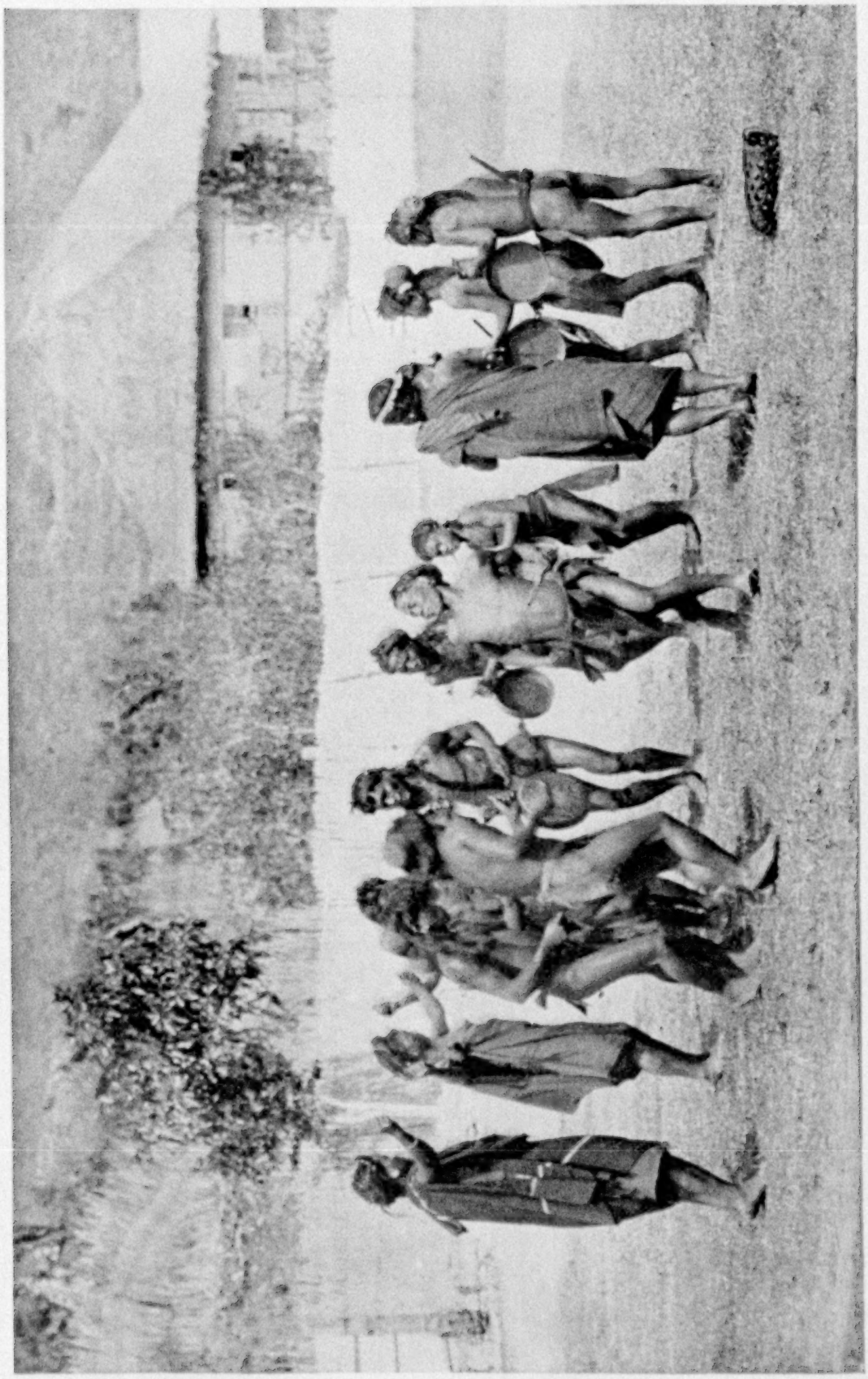
BONTOC IGOROTS WITH GANSAS

Note that the handles of the gansas are human lower jaws (see page 226)



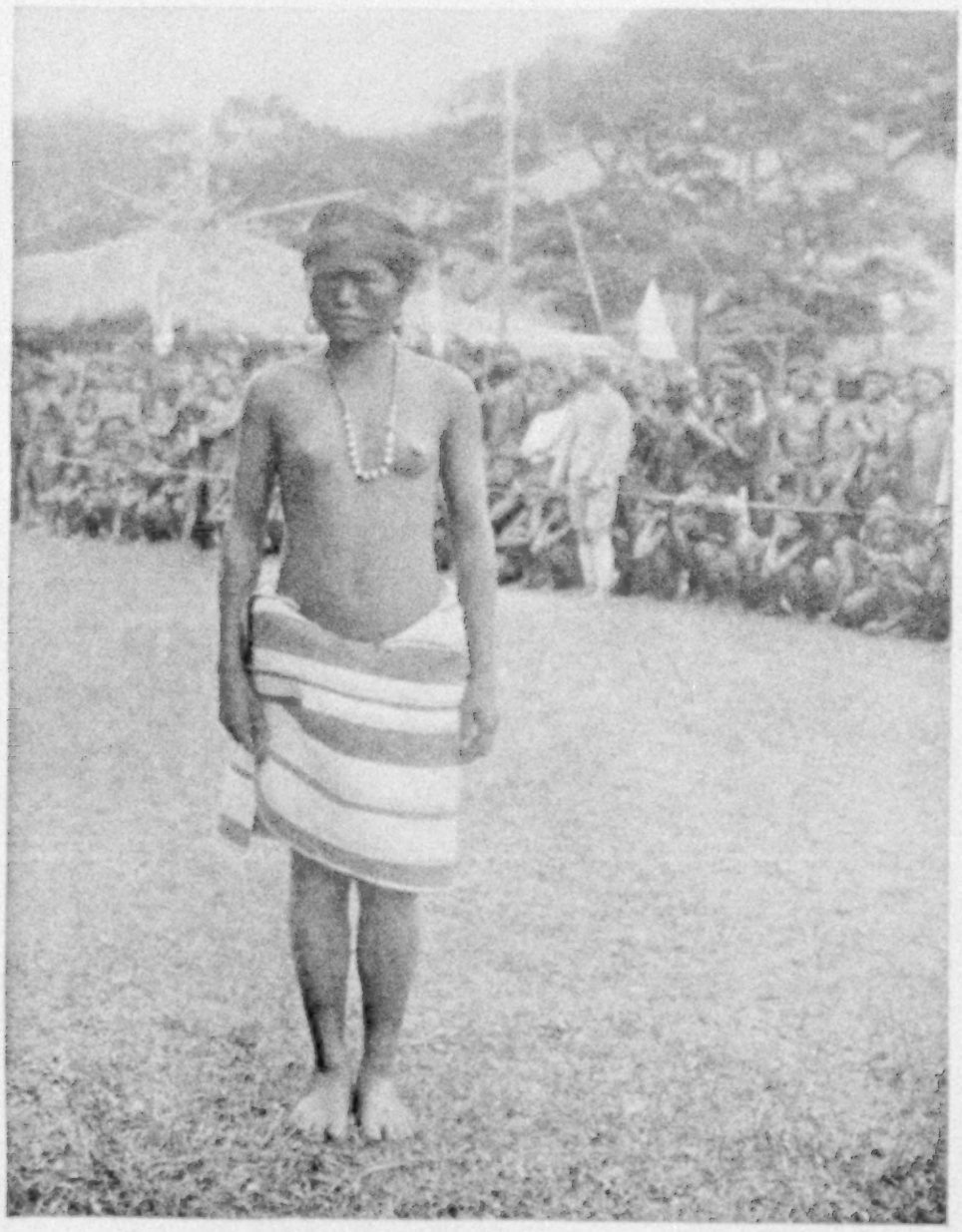
BONTOC IGOROTS DANCING

"The men crouch slightly as they dance. Their steps are springing and panther-like" (see page 226)



A HEAD DANCE AT BONTOC

Note the contorted position of the man at the center. He is the principal actor

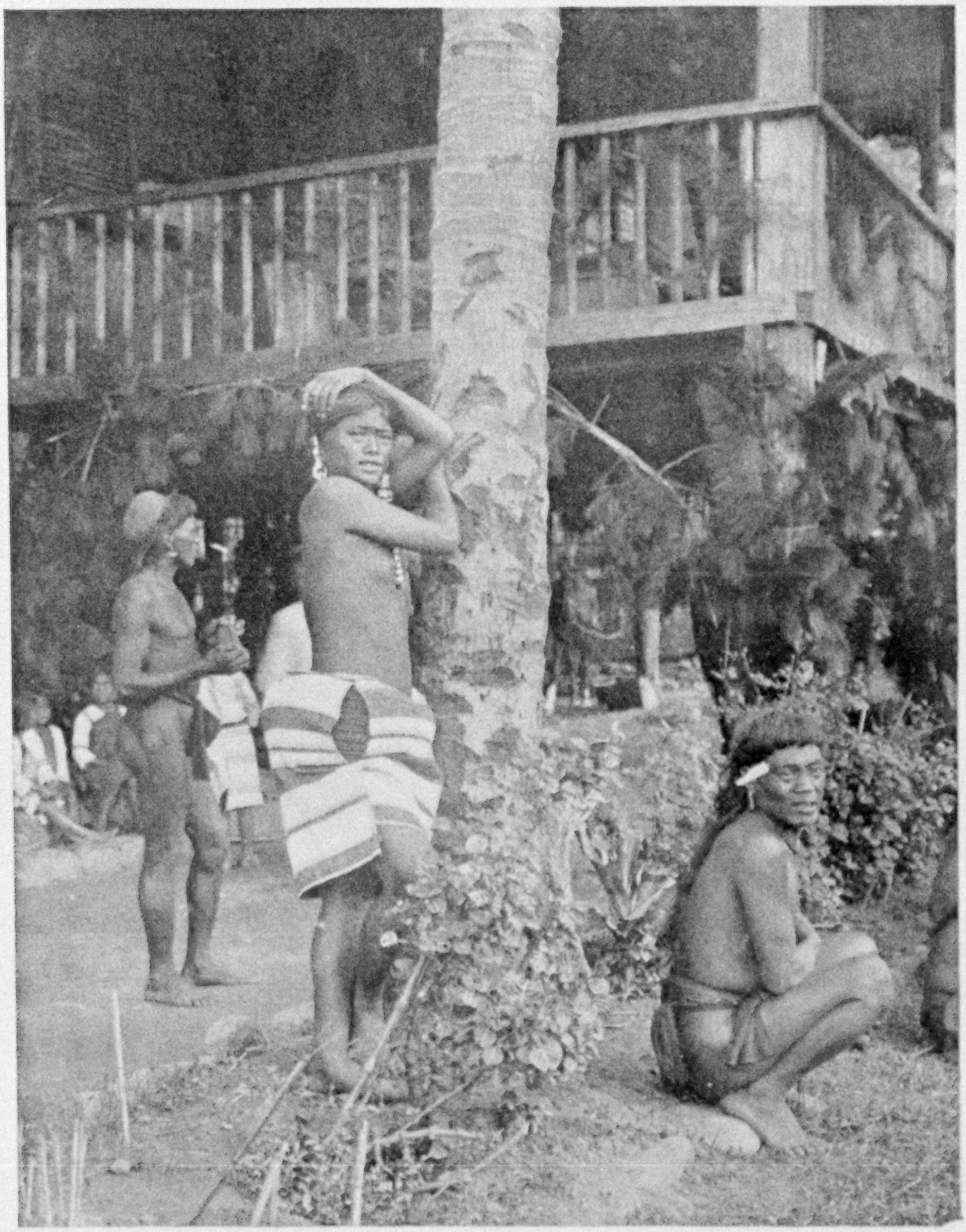


THE CHAMPION DANCER FROM BANGAD (SEE PAGE 232)

Chico near Bontoc, we catch, now and then, wind-borne musical notes, which rise and die away again and again, but gradually grow clearer. As we drop down a final bit of steep trail and come out on a flat-topped mountain shoulder, they swell out triumphantly, ringing harsh and clear, "ding-o, ding-o, ding-ding-ding-o" over and over again. There is nothing soft and soothing about this music. Its rhythm stirs one's pulse and one's toes in a strange fashion. The accompanying dance is a *man's* dance, danced by *men*. They move forward in single file. Each holds in his left hand a *gansa*, which he beats with a carefully fashioned skin-covered drumstick. The *gansa* handles are the lower jaw-bones of human enemies, slain no one knows how long ago (see pages 223-225).

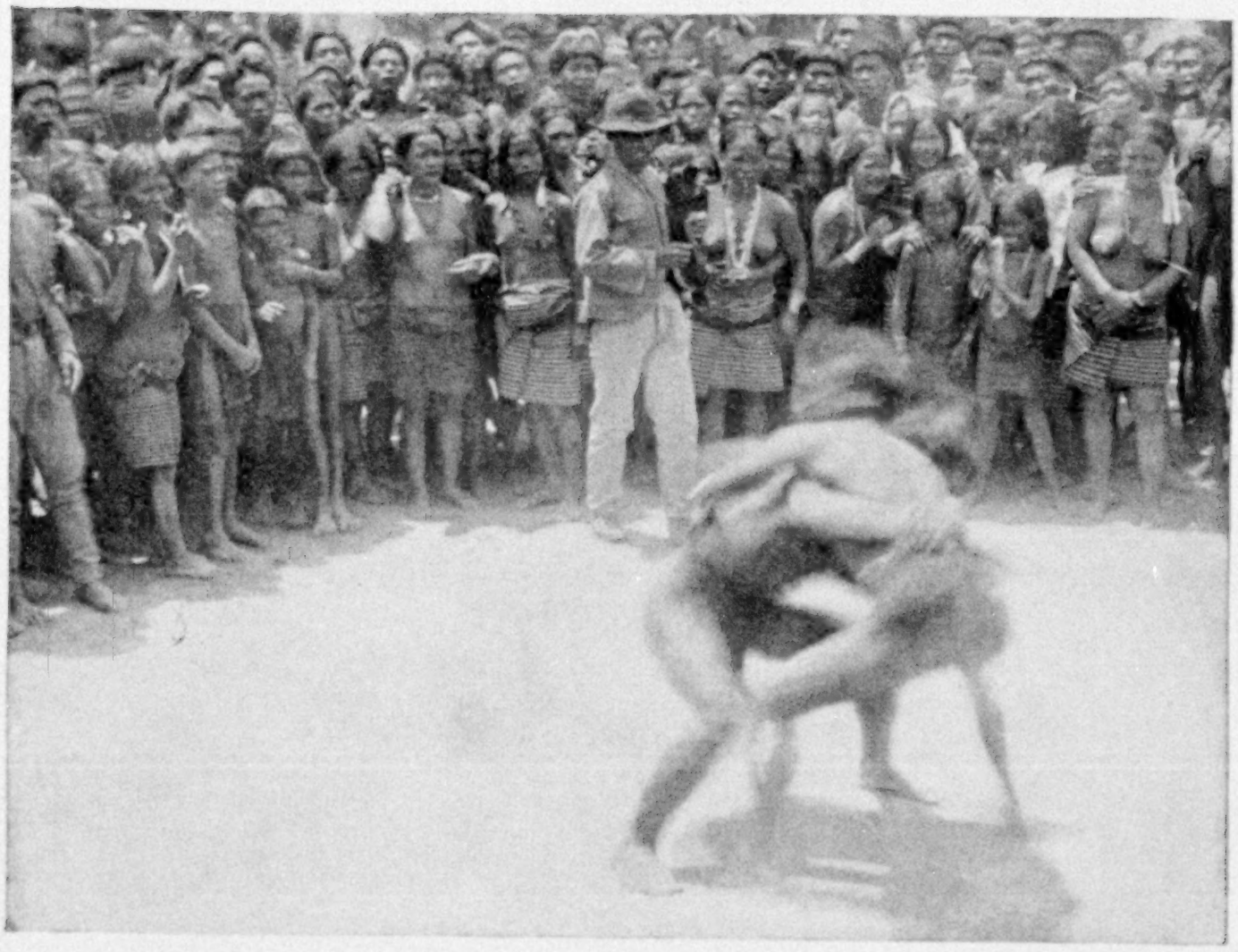
The perfectly developed brown bodies of the dancers are naked save for handsome blue and scarlet clouts and an occasional boar's tusk arm ornament with its horse-hair plume. Not a man has an ounce of superfluous flesh. There is a beautiful rippling play of perfect muscles under clear skin. The men crouch slightly as they dance. Their steps are springing and panther-like. As they advance, pause, and retire, their alignment is never broken and their movements are executed in perfect time. Take a snap-shot at them with a fast camera, develop the plate, and you will find that the positions of the hands and feet of any given dancer correspond very closely with those of every other. This is our welcome to the land of the head-hunter. As we come abreast the dancers, they break ranks, crowd up to shake hands, and then fall in behind us.

An hour more and again we hear *gansa* music. A sharp turn in the trail brings into view a little level meadow just above the brawling waters of the Rio Chico. A mighty roar of sound greets us, the full-lunged cry of a thousand Bontoc Igorot headmen drawn up on the level ground in two lines facing each other, while half a dozen groups of dancers beat *gansas* and add to the deafening clamor. Here are gathered the best fighting men from every little town in the



THE WILD DANCERS AT BONTOC

This is the same girl as shown in the preceding picture



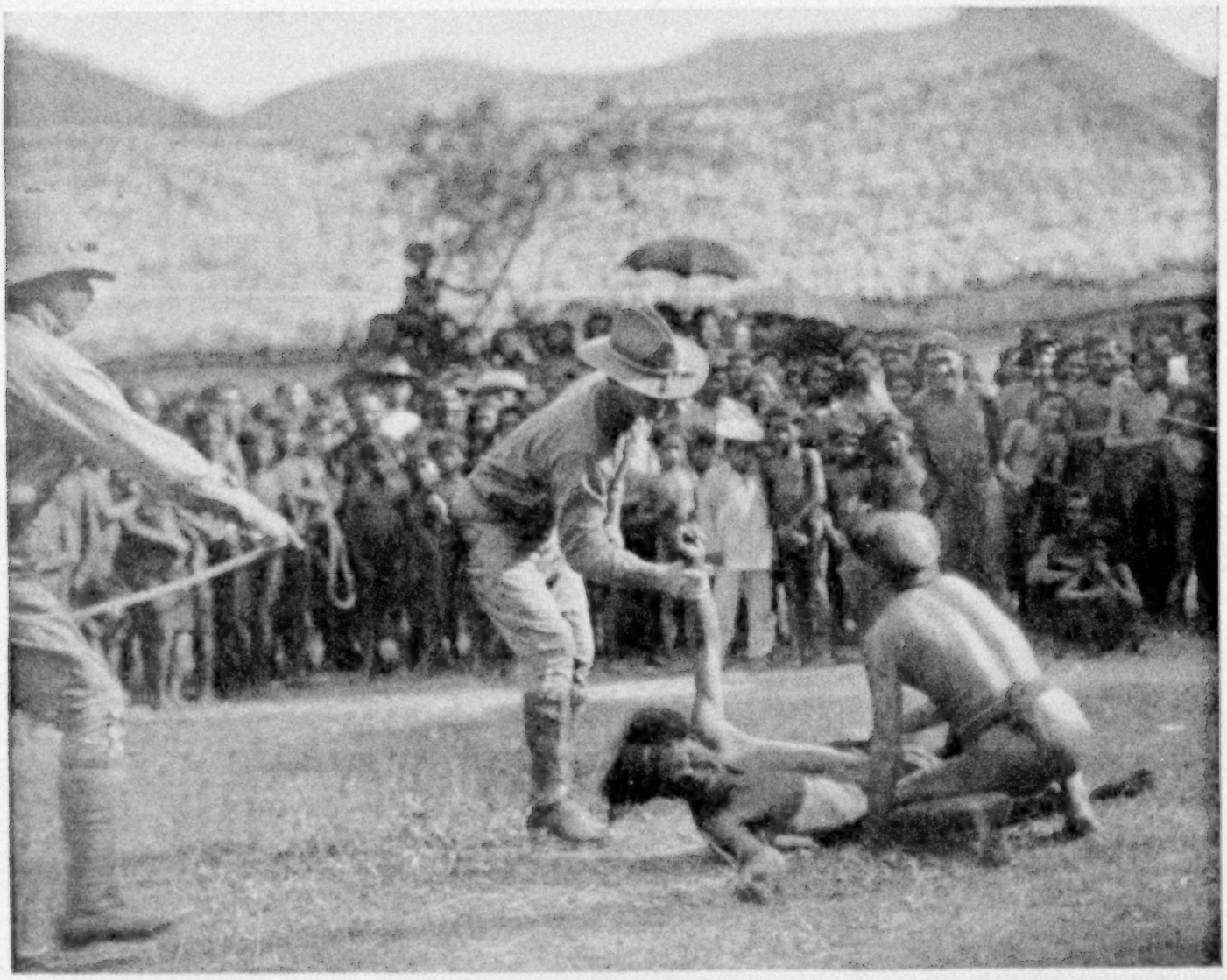
AN AMERICAN SUBSTITUTE FOR HEAD-HUNTING: A WRESTLING MATCH
(SEE PAGE 232)

subprovince. They crowd up to shake hands with us as we dismount and pass between their lines.

They force upon us squawking chickens, produced from heaven knows where, and eggs, many of which are of undoubted antiquity. Fortunately we knew what we were going to get into, and a couple of boys with baskets receive these gifts of friendship from us after we have taken them from the hands of the donors, as official etiquette prescribes. As we mount our horses, again there comes a yell which makes our ear-drums vibrate like the blast of a big steam-whistle. The wild man likes to yell and he is good at it. We ride on into the town, followed by an apparently endless file of Igorots, marching to the music of *gansas* and occasionally giving a shout that wakes the distant echoes.

On entering the town we pass under a series of graceful arches which the friendly people have seemingly evolved out of nothing. We ride on to the plaza, where we are saluted by a company of Bontoc Igorot constabulary soldiers, armed with Krag carbines and uniformed in caps, coats, ammunition belts, and loin cloths. With them, trousers are "taboo." We ascend to the balcony of the provincial building. In ten minutes the plaza is one solid mass of black heads and natty, bright-colored rattan caps.

At one side we note that the crowd is pushing and scrambling. They are thirsty after the long march in the sun. Some one has brought out a great jar of *basi*, and the liquor is being handed around in small blue-enamel wash-basins, from which two or three men try to



THE END OF A WRESTLING BOUT

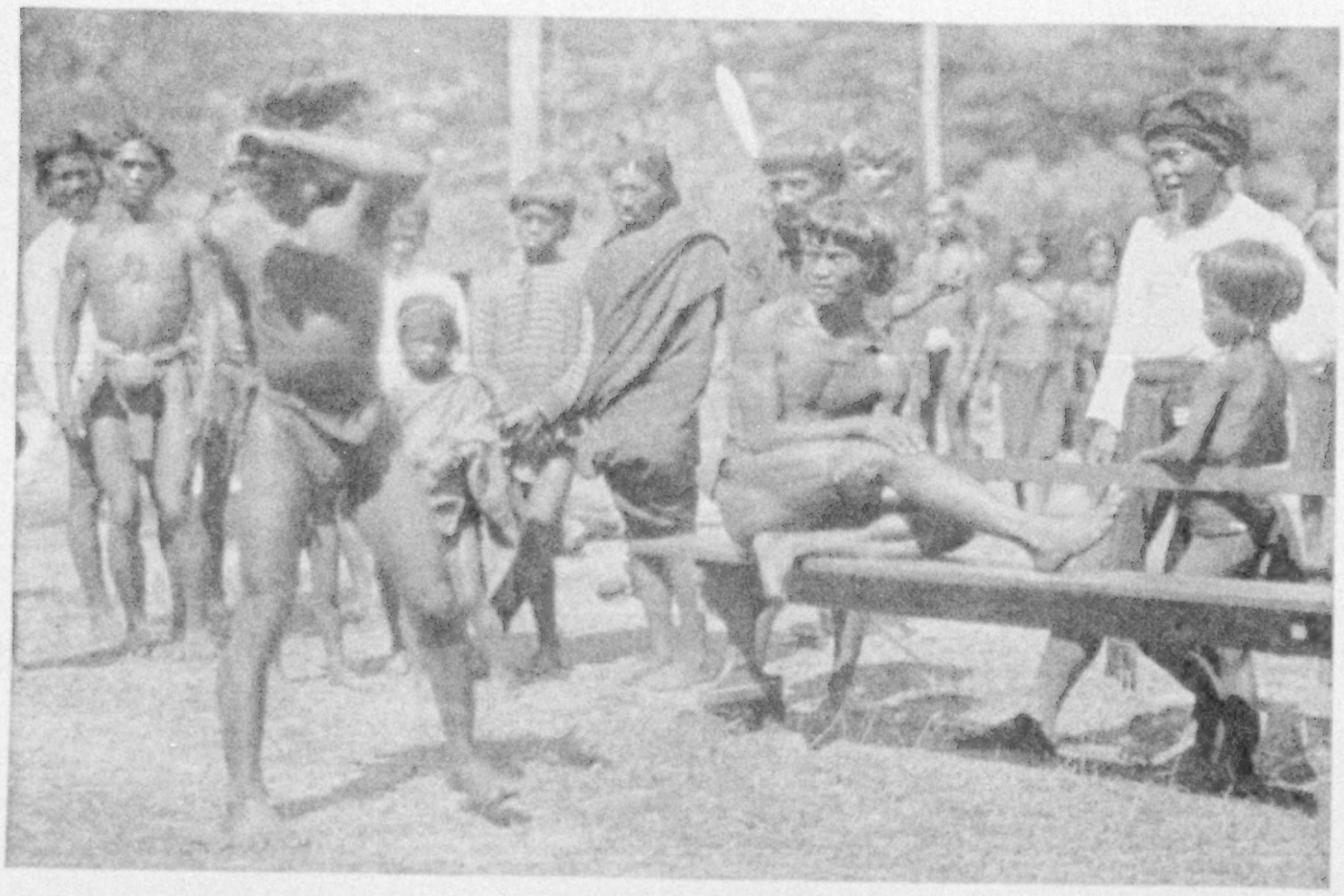
The judges and referee are Americans, and the Igorots have implicit confidence in the fairness of their decisions

drink at once. As a result half the *basi* is spilled on the ground, and no one gets much.

THE PICKED DANCERS OF BONTOC

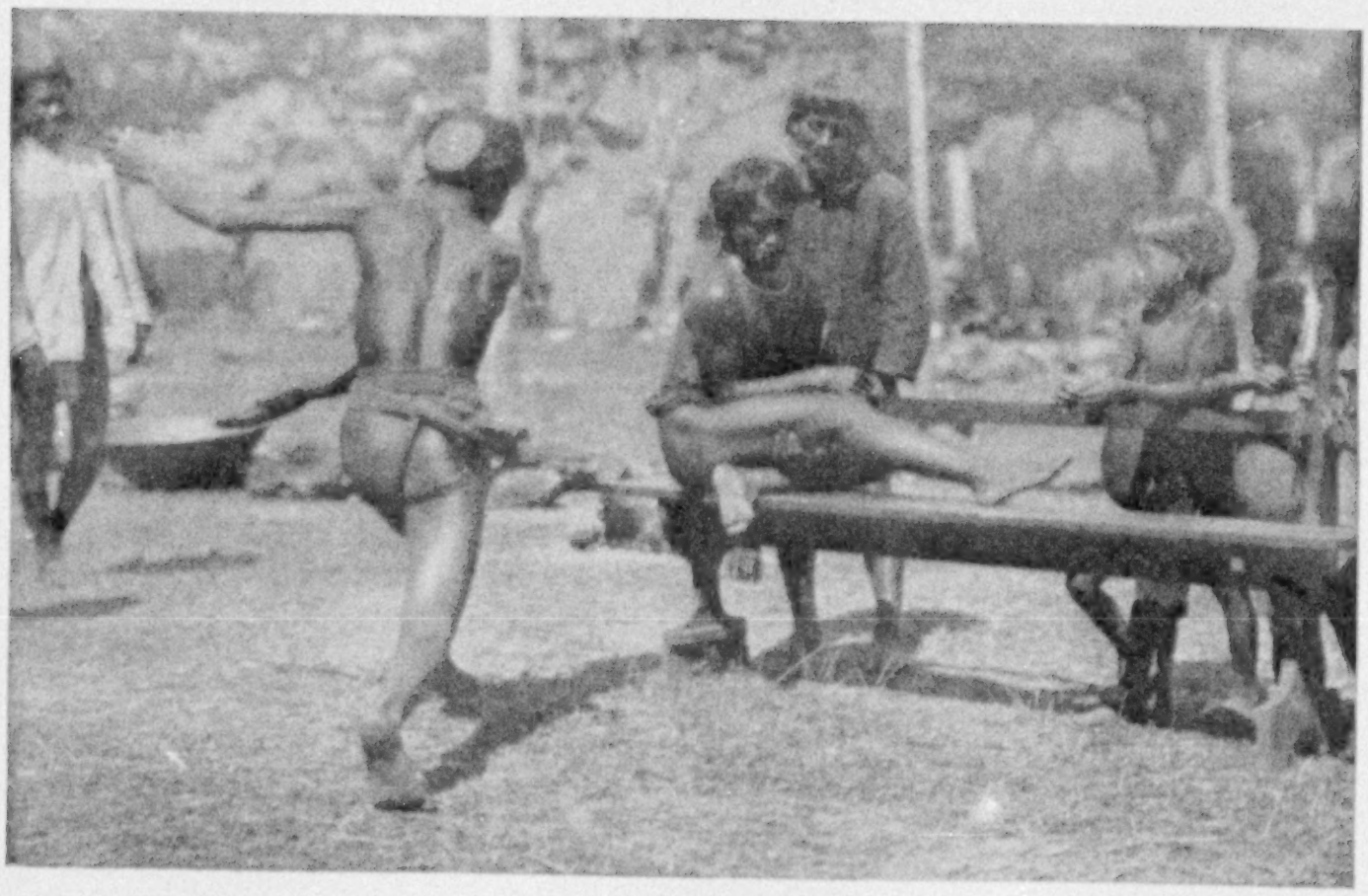
Now the *gansas* start up again. The crowd pushes back in all directions from a central point, and into the circle thus cleared step the picked dancers of Bontoc town, followed by a dozen of their women, each of whom wears a blanket draped from her left shoulder and under her right arm in such a way as to leave the right breast exposed. Music and dancing begin. It is the same dance that we saw beside the trail, save that the performers are now picked men, and that women are taking part. The latter dance with arms stretched horizontally from the shoulders, waving their hands in time to the music, at the same time rising on tip-toe and dropping down again, or lifting first one foot and then the other, either remaining in one place or moving forward or to one side very slowly. Their movements are more graceful than were those of the women whom we saw dancing at Cervantes, and many of them have wonderfully strong and well-developed bodies.

As things warm up, a famous fighting man, at the prime of life, steps lightly into the ring. The music changes a little and a real head-dance begins. Armed with head-axe alone, or perhaps with lance and shield in addition, the warrior

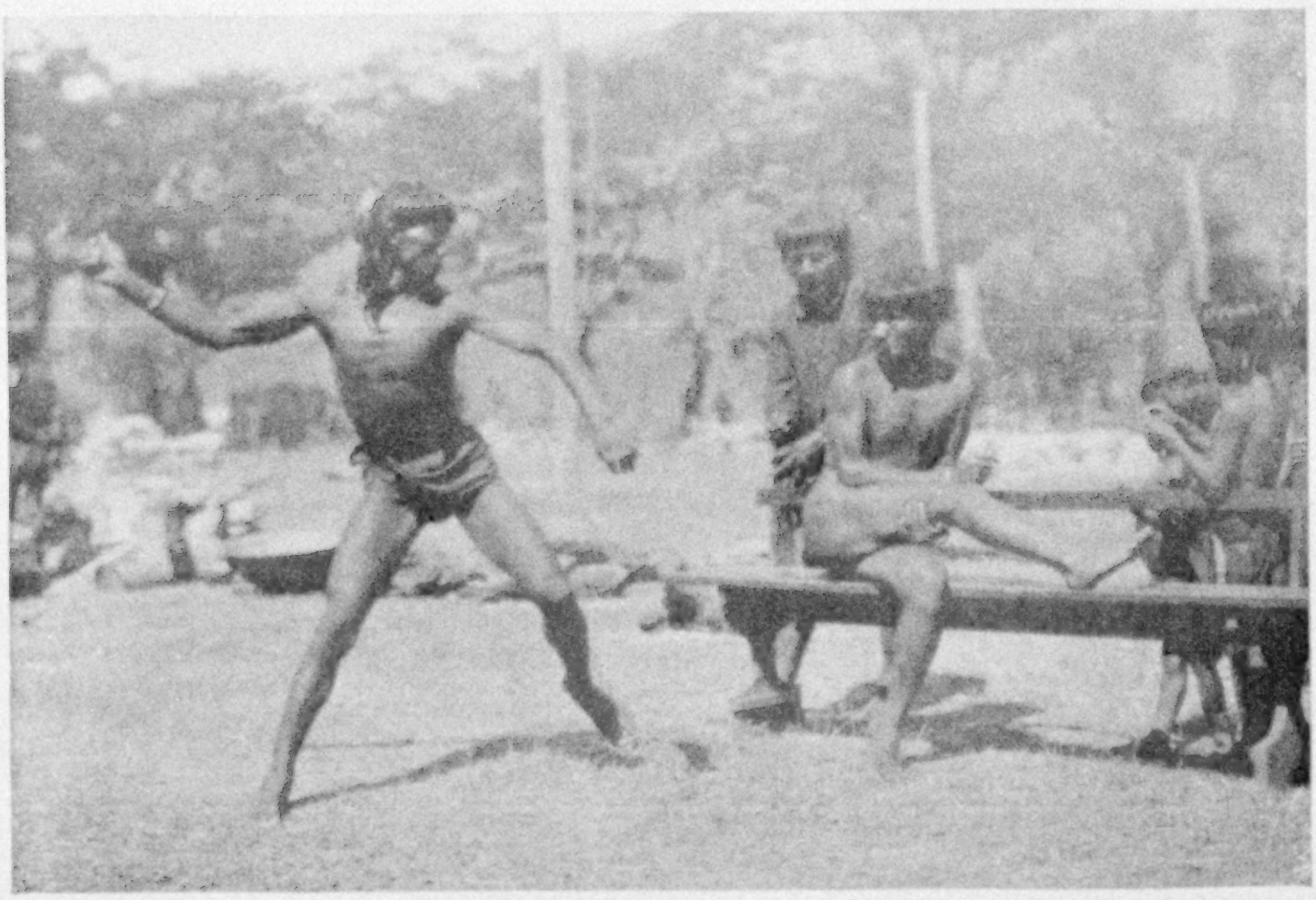


BONTOC IGOROT SLAPPING GAME

First position: striker ready to make his preliminary swing. The right arm is drawn behind as he swings on his right foot



Second position: the striker has just finished his preliminary swing (see page 233)



BONTOC IGOROT SLAPPING GAME

Third position: the striker ready to deliver his blow

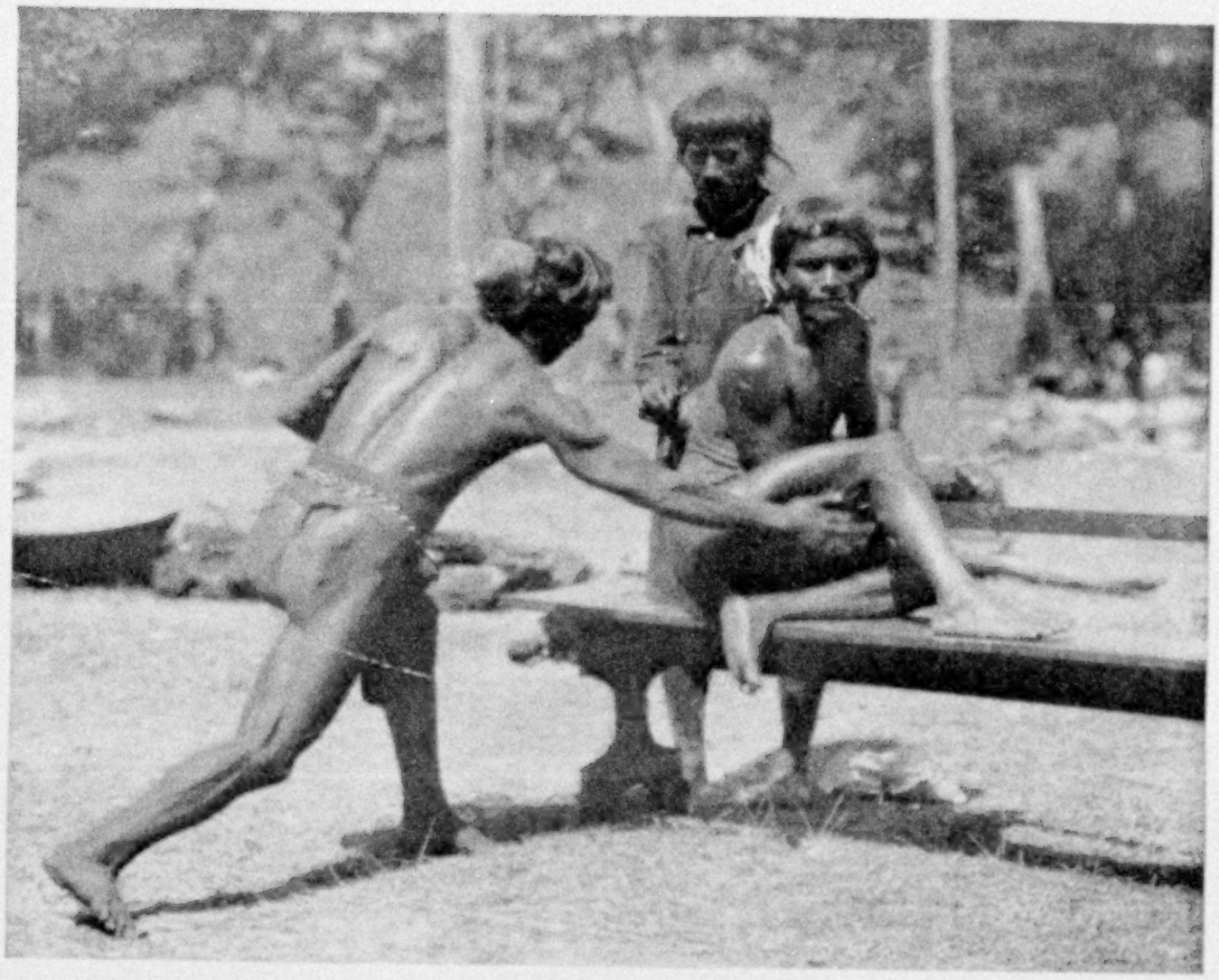
executes a pantomime, showing how he fought his enemy, killed him, and took his head. Meantime his feet never for a moment fail to keep time to the music. In two minutes we learn things about the handling of shield, lance, and head-axe of which we never dreamed. As the performance ends, the crowd indicates its appreciation by giving an ear-splitting yell. Those who have not been able to see the dancer nevertheless join in the applause on general principles.

The dancers from Bontoc town lay their *gansas* on the ground and retire, and a picked delegation of their ancestral enemies from the neighboring town of Tucucan snatch up the instruments and announce that they will show the people of Bontoc a little *real dancing*. This time two fully armed warriors indulge in mimic combat, advancing, retiring, thrusting, parrying, and keeping up a marvelous exhibition of skill and endurance, but withal never for an instant losing the step.

Town after town sends its dancers to the front, and each new delegation is generously applauded. This gives rise to good feeling, and presently the town lines, which were at the outset sharply drawn, begin to break down and people from two or more settlements dance together. The Igorot constabulary soldiers cannot resist the temptation to join in. At first they retain their uniforms, but soon get too warm, retire for a moment, and reappear stripped to their clouts. Their strikingly light-colored bodies show that the Bontoc Igorot, when free from dirt and sunburn, has quite a fair skin.

THE CHAMPION DANCER

We go down and mingle with the crowd, and, noting unusual excitement among the women at the edge of a dance circle, force our way through to



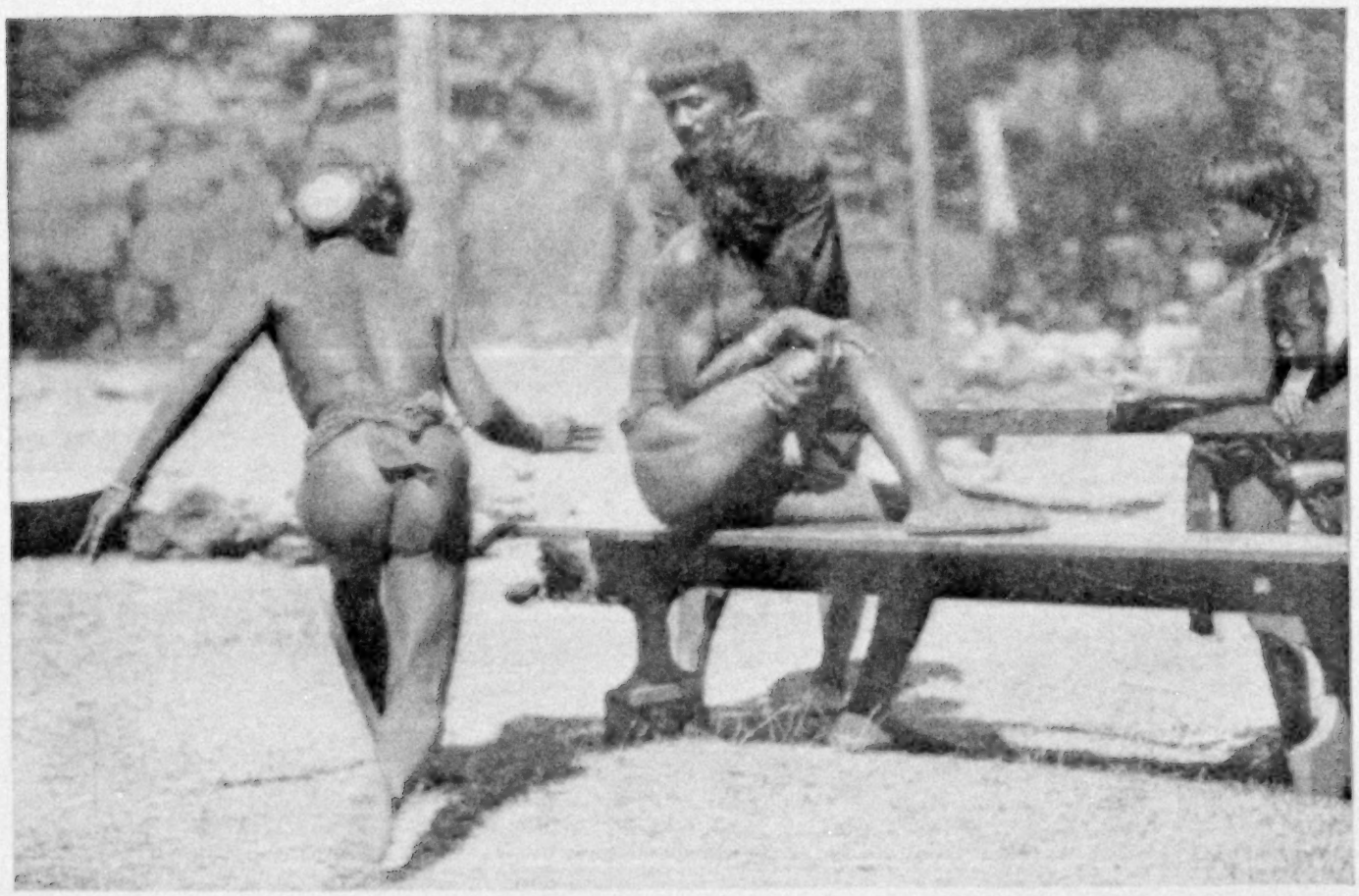
BONTOC IGOROT SLAPPING GAME

Fourth position: note the knots of muscle that spring out on the striker's arm, back, and legs as he strikes

ascertain its cause. We are well repaid for our trouble. The men from Bañgad, in the far north, have the floor. They have brought only one woman with them to uphold the reputation of their town, but she is abundantly capable of doing this. There is nothing slow about *her* dancing, nor does she bob up and down in one place like the Bontoc girls. She wears only a bright-colored and handsomely embroidered skirt, reaching from the waist to the knee and open up the right side, so that her movements are absolutely unimpeded. Her arms are stretched upward and outward, and her open hands are extended, palms up. Her chest is thrown out and her shoulders are held well back. Her arms and hands convey the impression of soaring wings, and she seems hardly to touch the ground. While the dance lasts she has no thought for anything else. When it ends and the crowd shrieks its approval, she becomes self-conscious, covers her face with her hands, and bounds away like a deer.

A WRESTLING MATCH

Now, with much pushing and jabbering, a larger ring is cleared. The towns of Tinglayan and Tucucan have had a difference of opinion over a stolen hog. They are to settle the matter by a wrestling match, instead of by fighting it out, as they would have done a few years ago. The two champions come forward and look each other over. Each reaches his arms behind the other and takes a



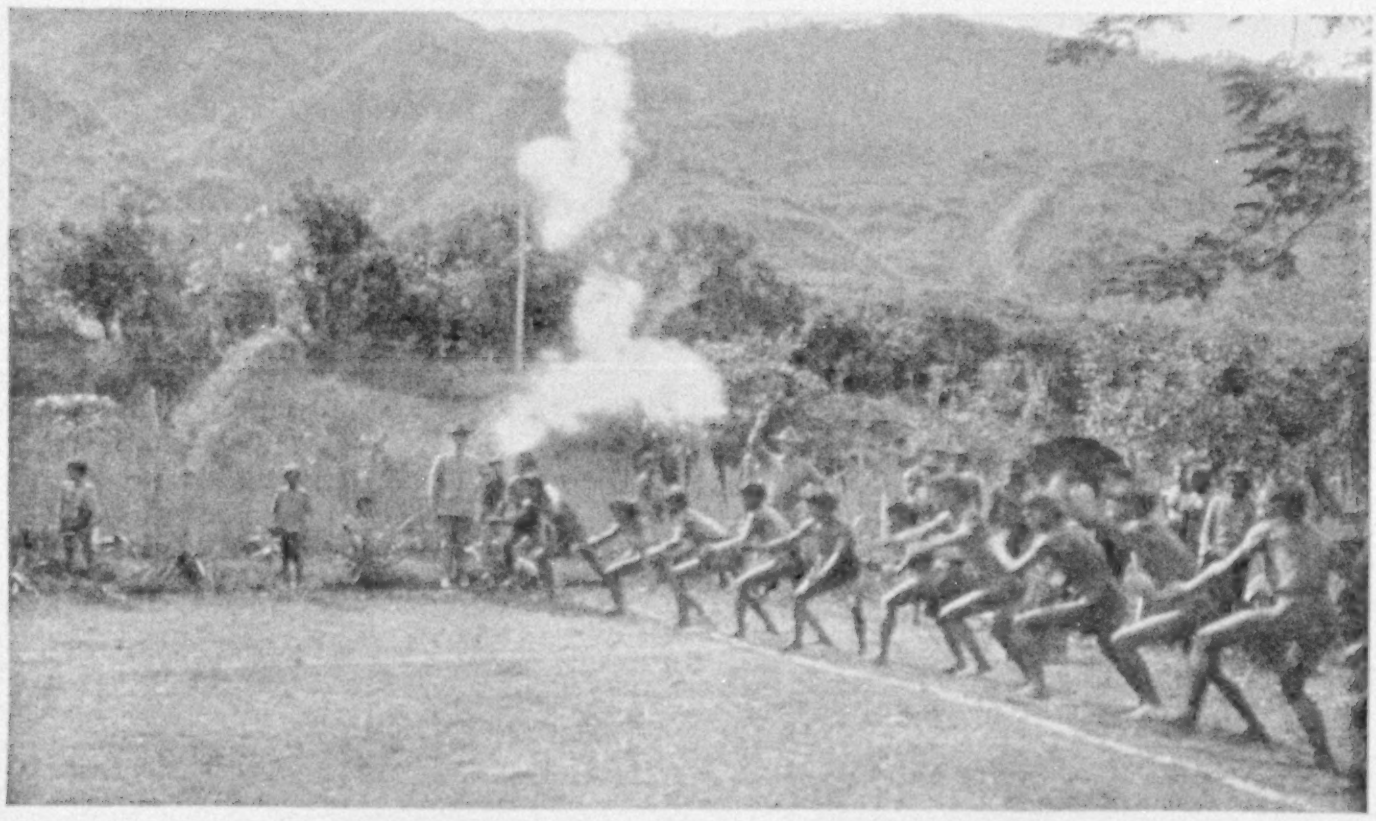
BONTOC IGOROT SLAPPING GAME

Fifth position: just after the blow. The man struck does not look happy

firm grip on the waistband of his opponent's clout. There is an instant of quiet, and then begins a curious hauling and tugging as each strives to lift the other bodily from the ground and throw him flat. Tripping is barred. The physical exertion involved is tremendous and the bout is almost always short. A single fall may decide the match, or it may be the best two in three. The judges and referee are Americans, and the Igorots have implicit confidence in the fairness of their decisions.

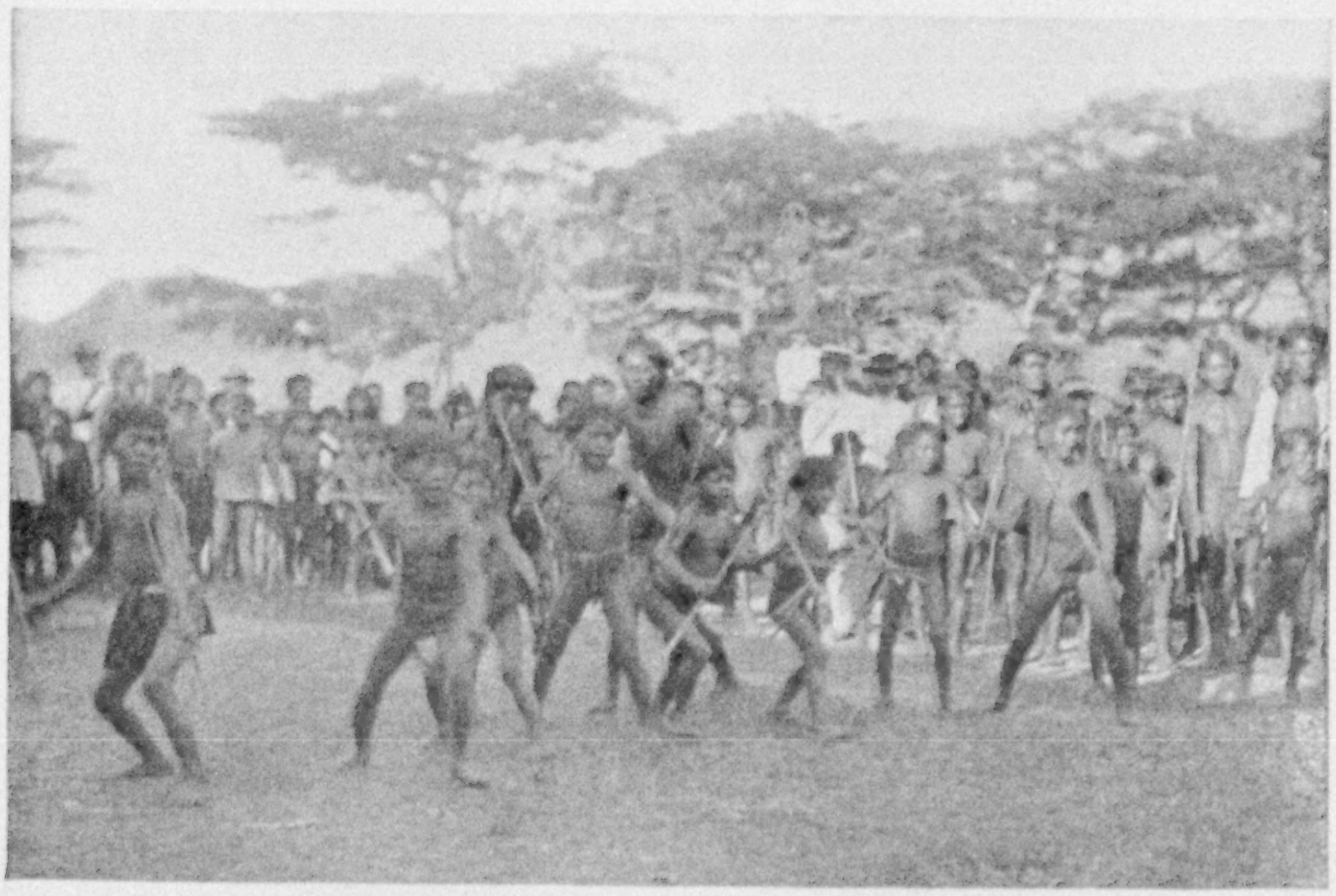
THE IGOROT SLAPPING GAME

A constabulary officer tells us that if we want to see a unique contest we must ask for the slapping game of the Bontoc Igorots from the towns of Kadaklan and Barlig. We want to see all there is going, and say so. A wooden bench is brought out and two lithe and muscular young men step forward. One of them squats on the bench, grasping his right thigh so as to tighten the muscles in a fashion which will be best understood from the accompanying illustrations. The other stands beside him and stretches out his right arm. He first throws it back and then sweeps it forward in a full round-arm swing. The blow falls on thin air close to the tightened thigh muscles of his opponent. He now swings his arm back again, his whole body turning with it, rises on the toes of his left foot, and puts every ounce of strength which he possesses into a stroke delivered with the flat of his hand full upon the rigid thigh of his opponent. Knots of muscle spring out on his arm, back, and legs as he strikes, and the blow cracks like a revolver shot. The recipient endeavors, sometimes with rather poor success, to preserve an expression of contemptuous indifference. The judges examine his thigh. If the blow has been hard enough, blood will show just beneath the skin, and he will



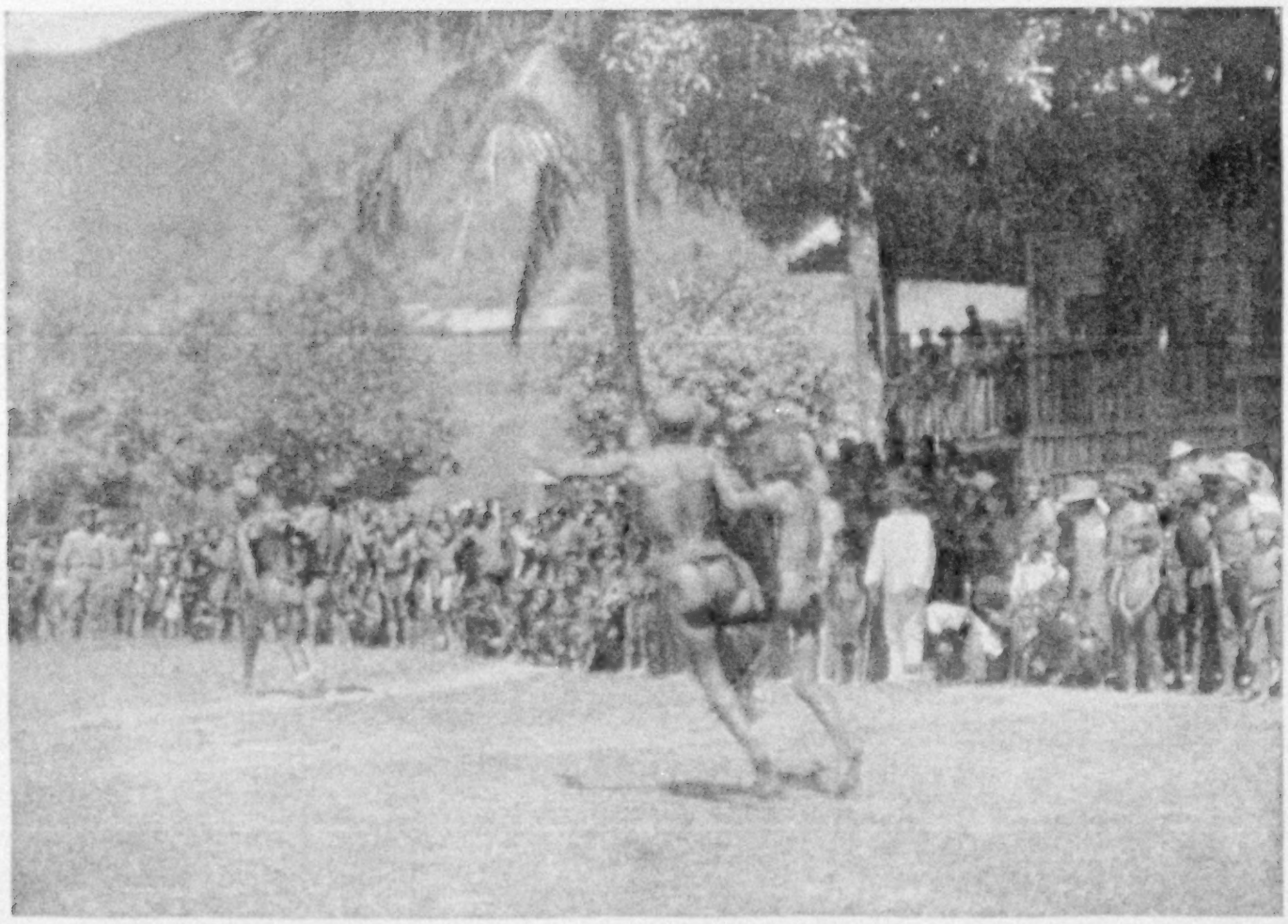
SUBSTITUTES FOR HEAD-HUNTING: THE START OF A BONTOC IGOROT MEN'S FOOT-RACE

"There is no beating the pistol at the start, no tripping or holding, 'no pocketing'"



A "WAR PARTY" OF BONTOC IGOROT BOYS THROWING RUNO STEMS AT ANOTHER PARTY

Note the men coaching them



A MEN'S THREE-LEGGED RACE

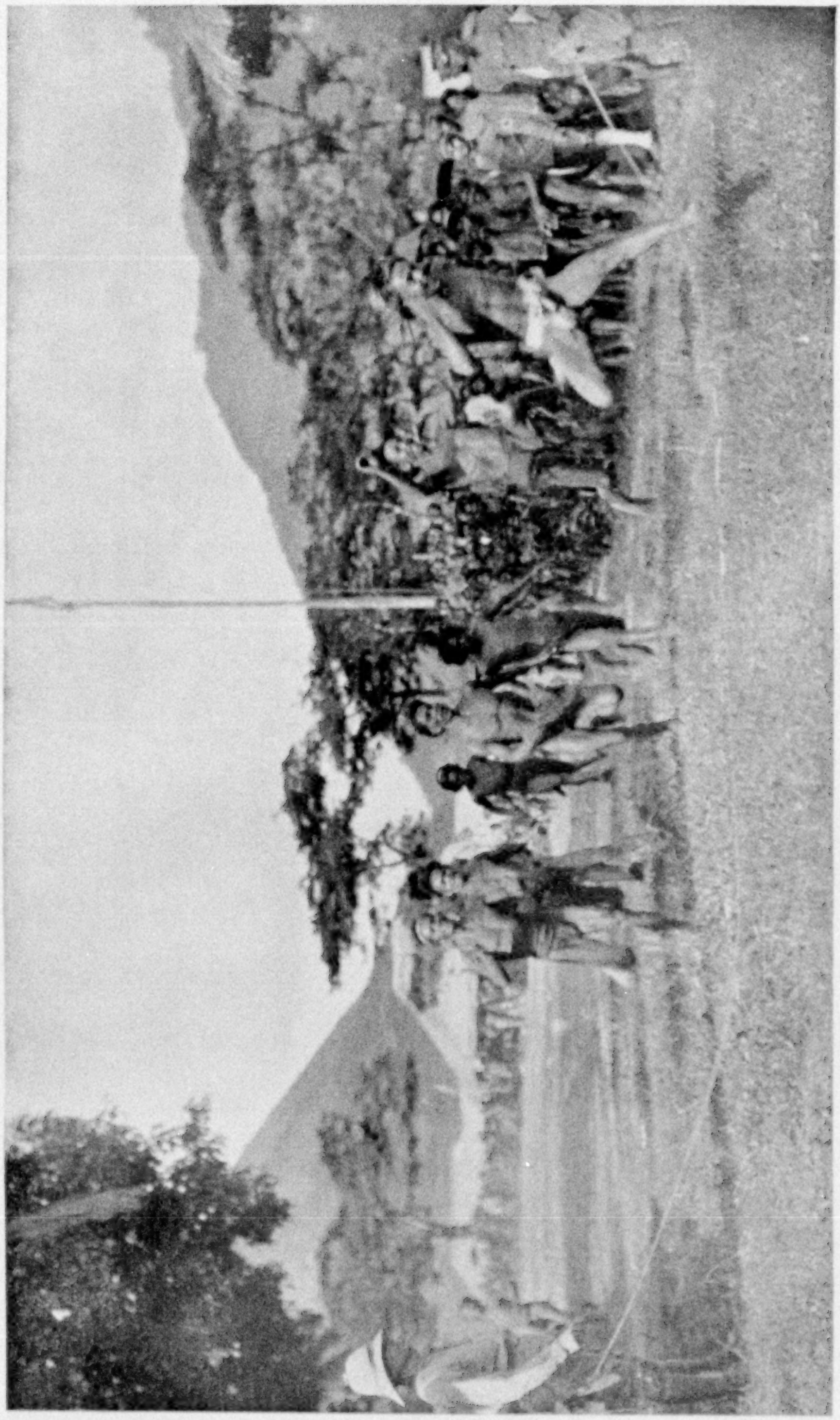
not have the satisfaction of taking a whack at his opponent; but, if this result has not been achieved, his opponent must take his place on the bench and be smitten. The contest continues until one succeeds in producing the bloody mark on the other.

RACES FOR ALL

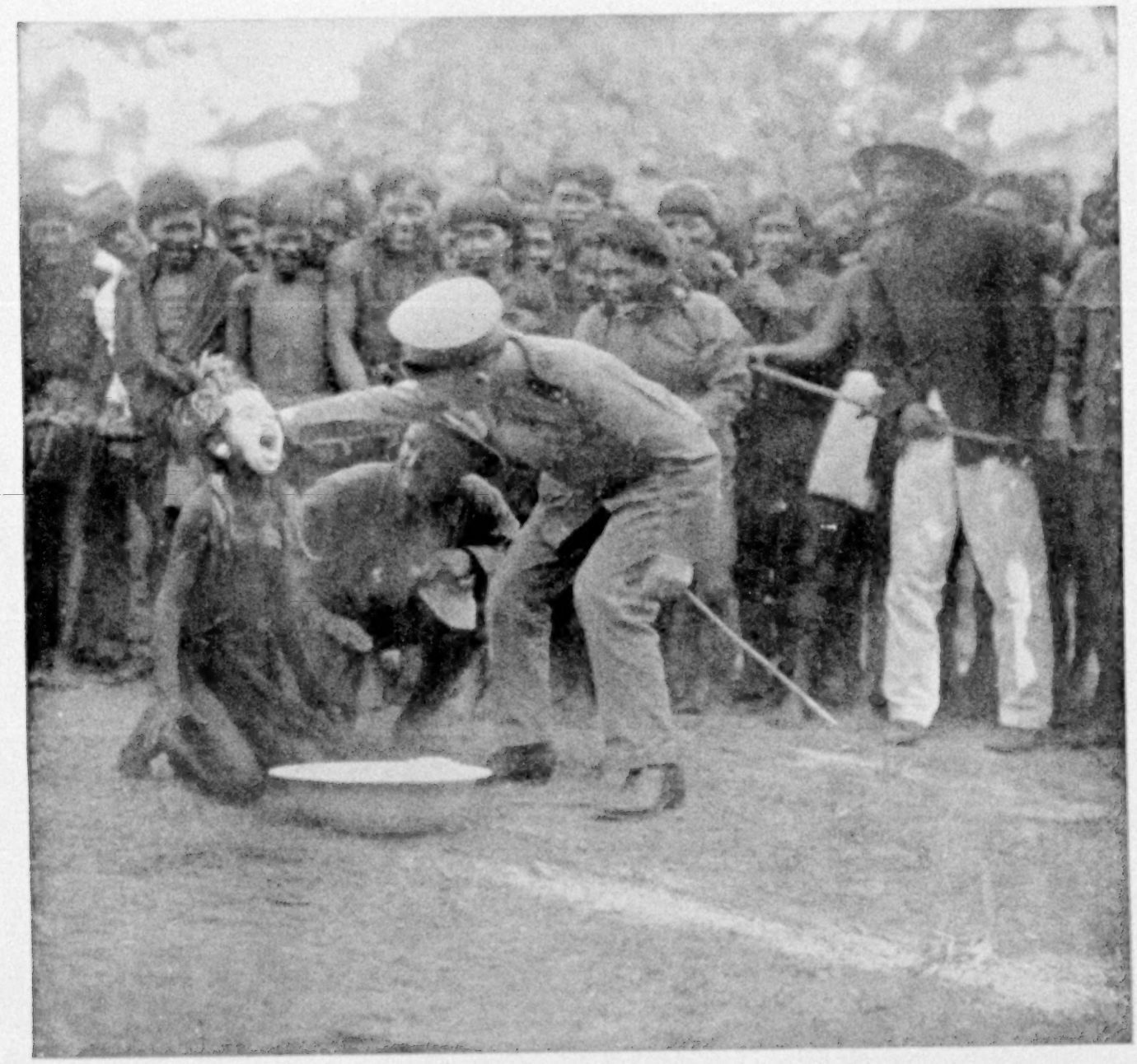
There follows lance-throwing at a target. The crowd always takes great interest in this contest, vigorously applauding the more skillful contestants and mercilessly jeering those who throw badly.

The Igorot has now pretty well exhausted the list of his native sports, but he has been quick to learn from the Americans, and there is still much fun in store for him and us. A half dozen unarmed constabulary soldiers appear with a long rope. After much pushing and pulling they succeed in forcing the crowd back with it, and thus clear a track for short foot-races. There follow in quick succession a *presidentes'* race, a *vice-presidentes'* race, a race for picked men from the different towns, a men's three-legged race, and a free-for-all race for women. There is no lack of contestants. Indeed, it is difficult to keep the number down to the limits imposed by the width of the track. The innate sportsmanship of these hillmen comes out very clearly in running contests. There is no beating the pistol at the start, no tripping or holding, no "pocketing," no dirty work of any sort. The competition is both clean and good-natured. The prize may be anything from a flannel shirt or a woolen blanket to the honor to one's town. The winners are happy and the losers are *good* losers.

The next event is a wheelbarrow race, which causes much merriment. The prize is a scarlet blanket hung on a stake at the end of the course, and he who



THE FINISH OF A BONTOC IGOROT MEN'S FOOT-RACE

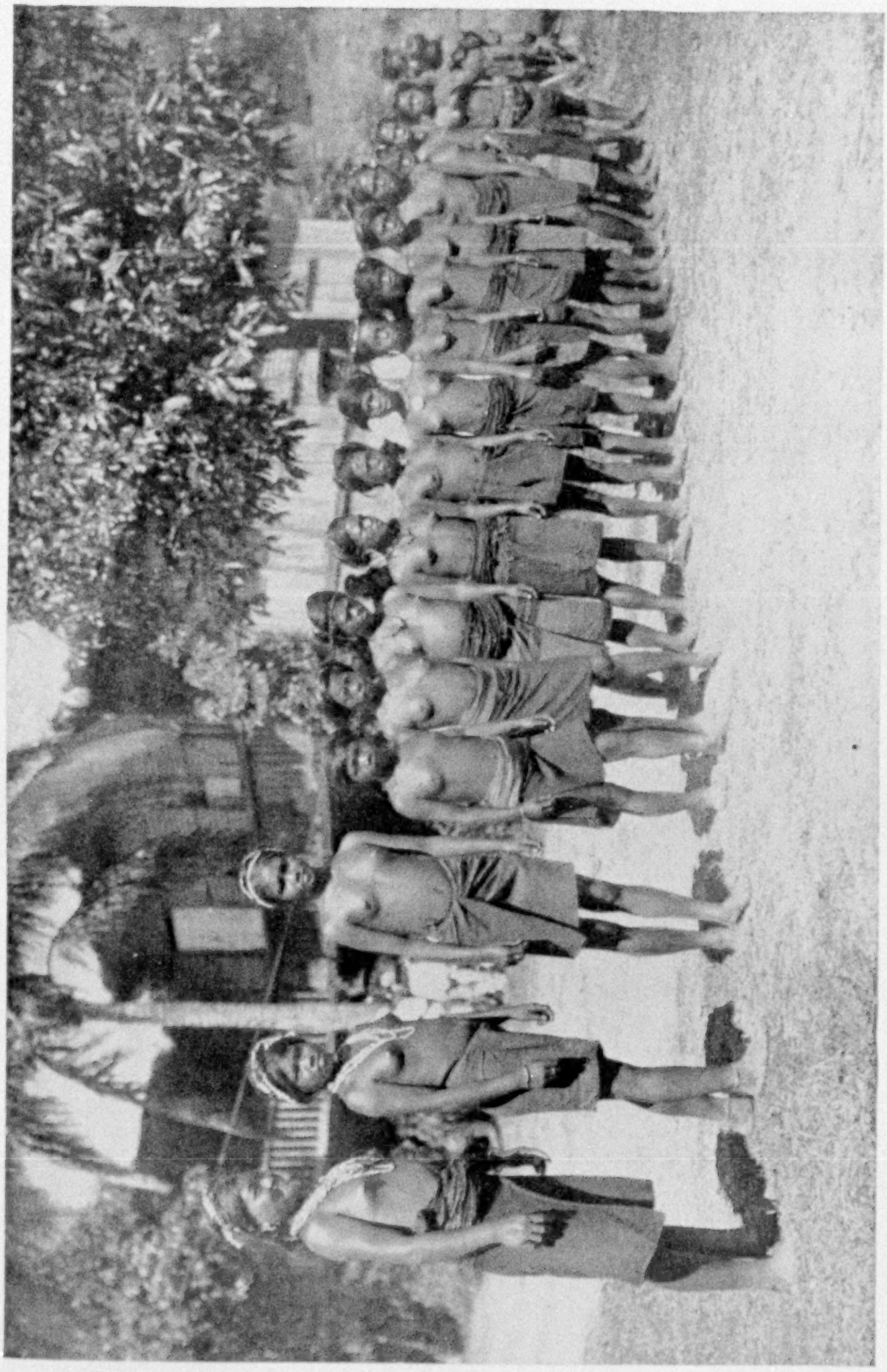


A BONTOC IGOROT BOY WHO HAS BEEN BURROWING FOR COINS IN A DISH OF FLOUR
(SEE PAGE 239)

gets it has it. There are four contestants. At the start one of them tips his barrow over and two others turn completely around. The fourth, through extraordinary skill or great good fortune, makes a straight run from the starting point to the stake, snatches the blanket, and disappears without once looking back. He is taking no chance of losing the prize!

THE GREASED-POLE CONTEST

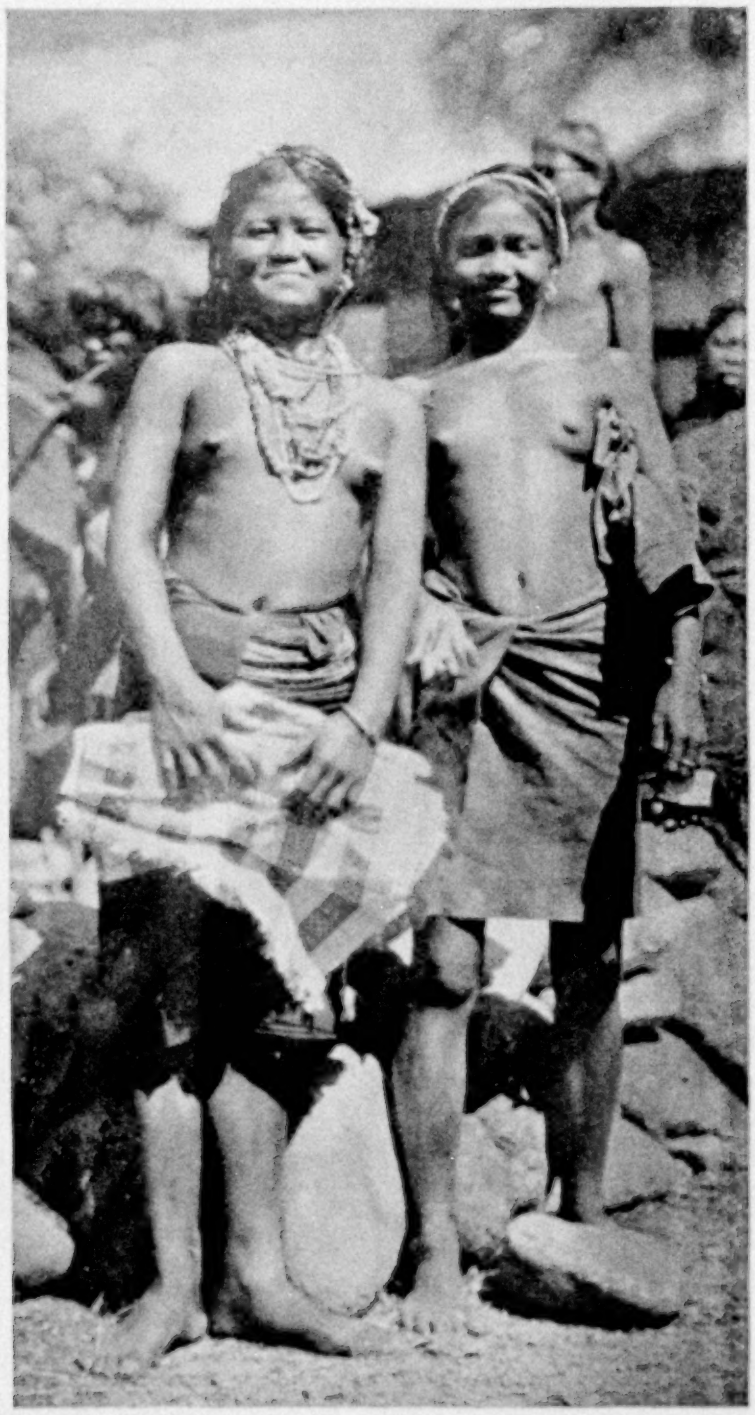
Now comes the time-honored greased-pole climbing contest. In this case the "pole" is a *bamboo*, planted firmly in the ground and held in place with rattan guy-ropes. From a stick thrust into the top of the bamboo hangs a bag of coin. The wild man can climb like a monkey, and he hails this opportunity with delight, but there is a surprise in store for him. Bamboo in its natural state is smooth enough, but when it is thoroughly greased no living man can climb it. However, each new contestant wipes a little more of the grease off and goes a bit higher than his predecessor. Some climb with legs twisted around the bamboo; others use only their hands and feet.



BONTOC IGOROT GIRLS READY TO START IN A FOOT-RACE: THERE IS NO LACK OF CONTESTANTS IN ALL THE GAMES
(SEE PAGE 235)

Eventually a smart constabulary soldier makes a try. When he reaches the hitherto unclimbed and consequently most slippery portion of the pole, he produces wood ashes from the waistband of his clout, and, holding on with his legs, proceeds to apply them. In this way he gets near the top; but at the last, when he can almost grab the bag, his strength gives out. Down he slides, slowly at first and then faster and faster, hitting the ground with a resounding thud, and shaking his burned hands as he goes off to renew his stock of ashes. Meanwhile a long-haired heathen from the north starts with a running jump, goes up the bamboo like a streak, and grabs the bag.

The small boy is not forgotten. He is allowed to bury his face in a wash-basin of flour and grope for coins, which, when found, must be seized in his mouth; or, he is blindfolded and hunts for dearly loved cans of salmon scattered on the ground. He forms war parties, which attack each other with runo stems in lieu of lances, and, in general, like the small boys of other countries, he makes a prodigious noise, gets in everybody's way, and has a wholly delightful time.



THE WINNERS OF THE GIRLS' FOOT-RACE

The girl on the left won first prize, the roll of cotton which she holds in her hands

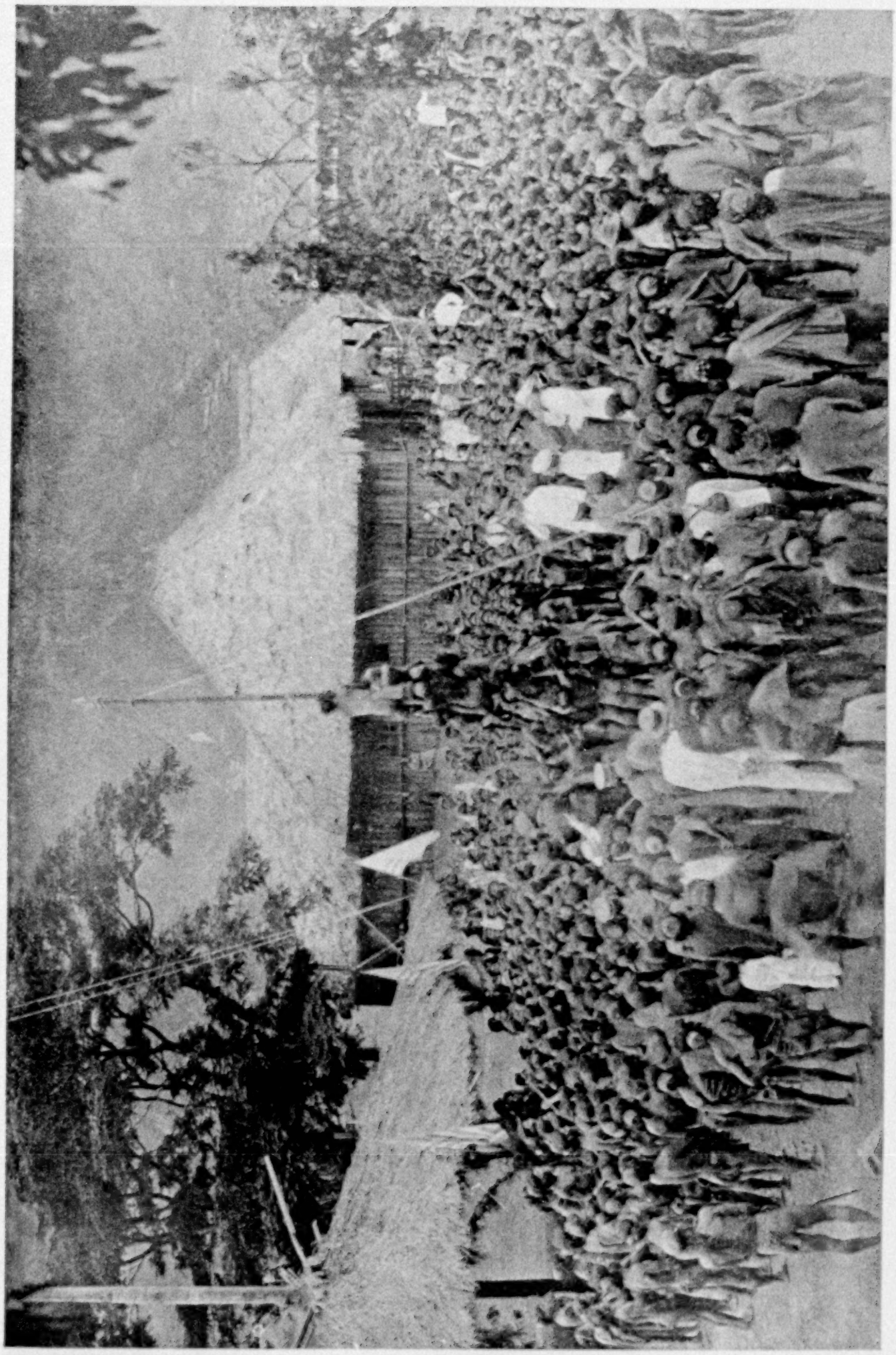
THE TUG-OF-WAR

And now comes the great event of the day. The wild man accepts with appreciation the American's greased-pole contests and wheelbarrow races, and grows enthusiastic over foot-races, but he has taken the tug-of-war to his bosom and made it his own.

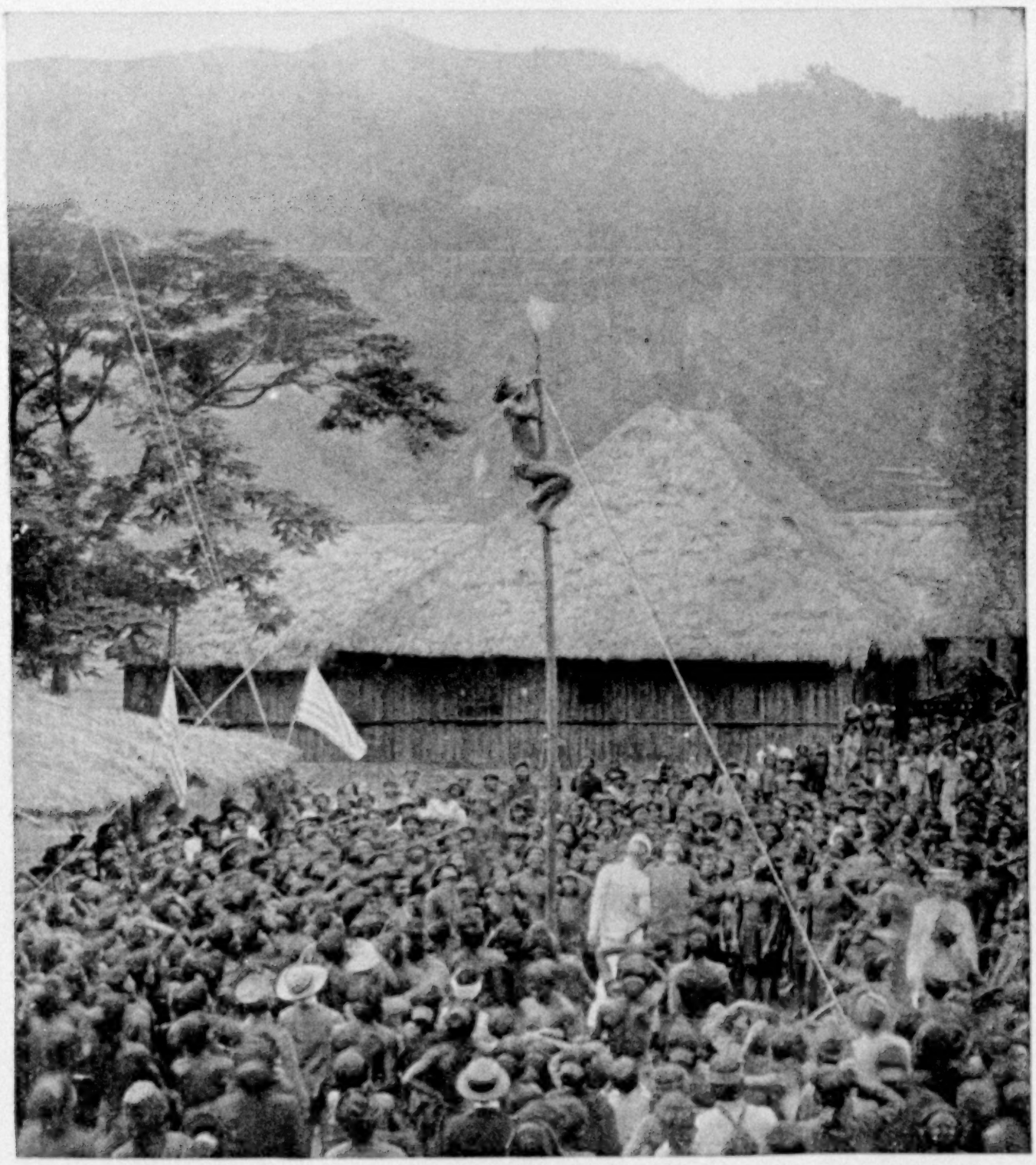
Samoqui and Talubin, old enemies, are to pull first, twelve men on a side, coached by their respective *presidentes* and cheered on by most of the male citizens of their respective towns.

A heavy rope is produced and a white string is tied at its center for a marker. Two canes are stuck up a yard apart, and the American referee puts his foot on the rope with the white mark exactly midway between these canes. The members of the two teams silently take their places and vigorously begin to dig footholds. The "anchors" have no belts, but wrap the ends of the rope around their bare waists. Each *presidente* counts the members of the opposing team to be sure that their number is correct. The men are now warned to get ready. Digging ceases and they stand like statues.

The pistol cracks and the rope tightens



A POPULAR AMERICAN SUBSTITUTE FOR HEAD-HUNTING: THE GREASED-POLE CONTEST



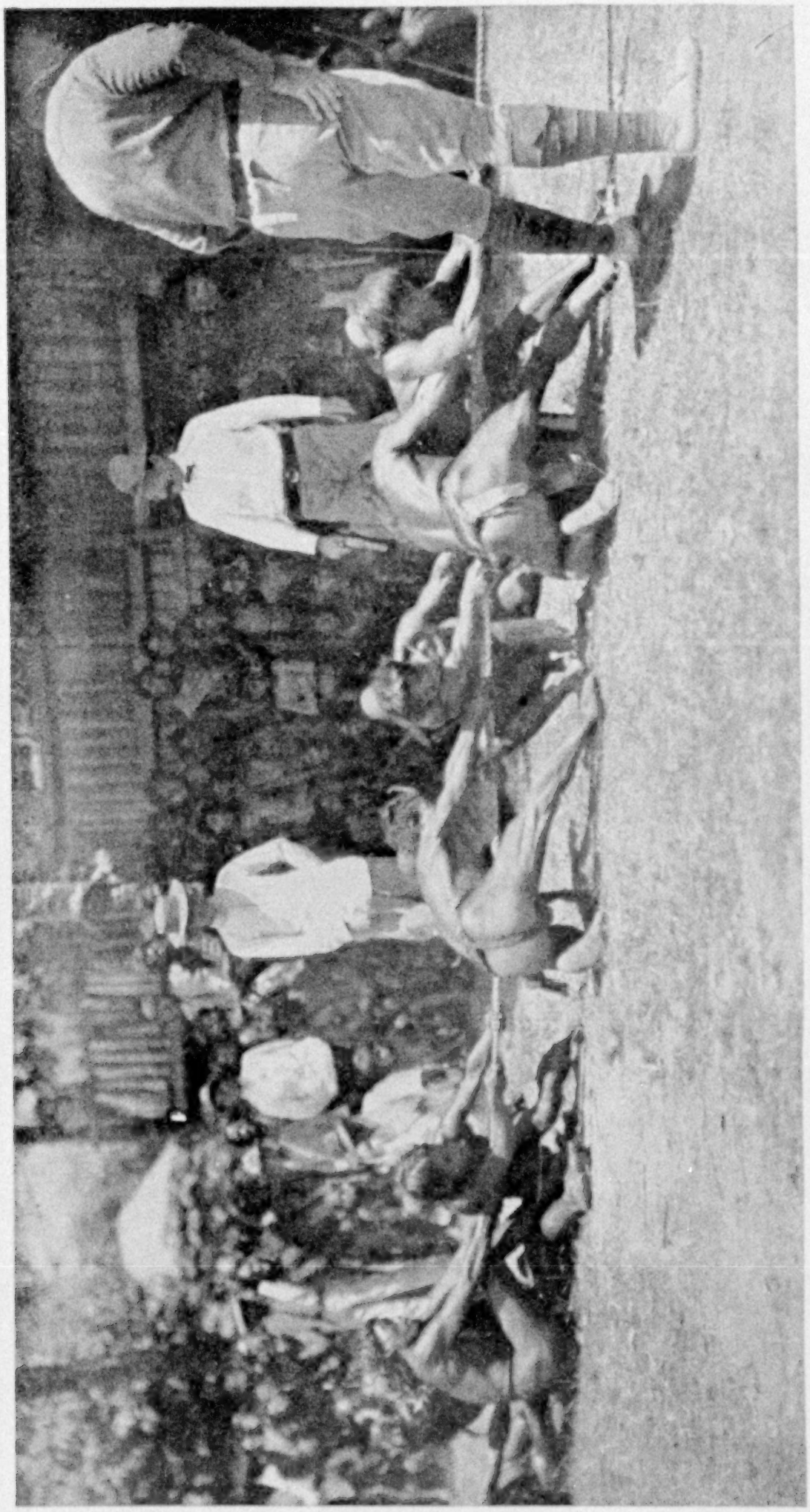
CLIMBING THE GREASED POLE

"A long-haired heathen from the north starts with a running jump, goes up the bamboo like a streak and grabs the money bag" (see page 239)

with a vicious strain. The white marker has apparently not deviated from its central position by a hair's breadth. Both teams have dropped exactly together and now how they pull and how their perfectly developed muscles stand out! A minute goes by, then two, three, four. The rope moves a bit. Talubin gains an inch and loses it; gains two inches and holds one of them for a while. Then the white marker slowly but very steadily moves back whence it came and continues to move toward the Samoqui side. Samoqui is too heavy for Talubin.

ANOTHER SUBSTITUTE FOR HEAD-HUNTING: A TUG-OF-WAR BETWEEN BONTOC IGOROTS OF SAMOQUI AND TALUBIN

The pulling has just begun (see page 239)



TUG-OF-WAR BETWEEN SAMOQUI AND TALUBIN

This photograph shows a part of the Talubin team pulling their hardest

AN ENTHUSIASTIC AMERICAN COACHING TALUBIN, WHO ARE WEAKENING: THE ROPE IS SLIPPING THROUGH THEIR HANDS

An enthusiastic American, who perhaps himself pulled in his college days, rushes up to coach the Talubin men. He tries to get them to heave, and to heave together, but it is now too late. They can only hold on for dear life while the rope is gradually pulled through their burned and bloody hands. Samoqui heaves and gains three inches. She heaves again and gains half a foot. She heaves a third time and the white marker passes the cane on her side.

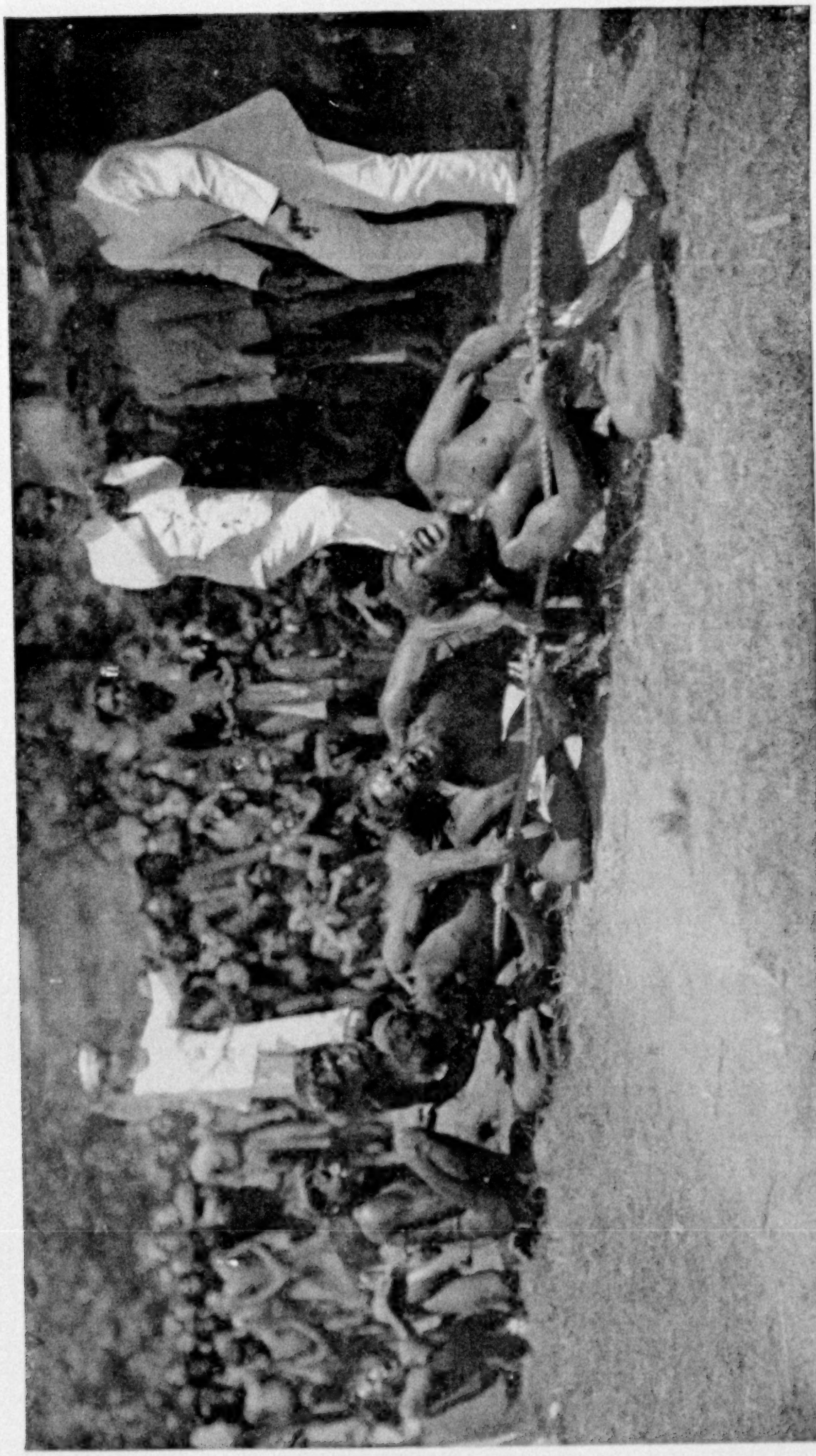
So Samoqui wins, after 7½ minutes of pulling that would disable the members of a white team. The yelling has been ear-splitting before, but now pandemonium breaks loose. The backers of the Samoqui team leap into the air and scream themselves hoarse. Talubin yells a little herself just to show that there is no hard feeling, and every one else joins in for luck. Ultimately the tumult lulls, and, while the Talubin people are telling the Samoqui men what they will do to them next year, Tucucan and Tinglayan line up for the next pull. So the fun continues until darkness falls and the crowd adjourns for its evening meal.

A DELEGATION FROM LUBO

Now great fires blaze out on the plaza, and around them the fighting men gather and sing the fame of warriors who are dead; sing of their own brave deeds; of their troubles with the Spaniards; of the coming of the Americans with their strange new ideas, and of all that has since happened down to the day which is just ending. Until customs change, no secret service will ever be needed in Bontoc. If a head has been taken, go and sit at the camp-fires and sooner or later the guilty man will sing and tell you all about it.

Now and then a particularly enthusiastic delegation dances a bit. We are tired out, so turn in, and the singing and the dance music soon mingle with our dreams.

It is 5 a. m. and we are in the saddle



THE FINISH: SAMOQUI WINS: THIS IS THE WINNING TEAM

PART OF THE IGOROT TOWN OF LUBUAGAN, SHOWING THEIR RICE TERRACES (SEE PAGE 247)

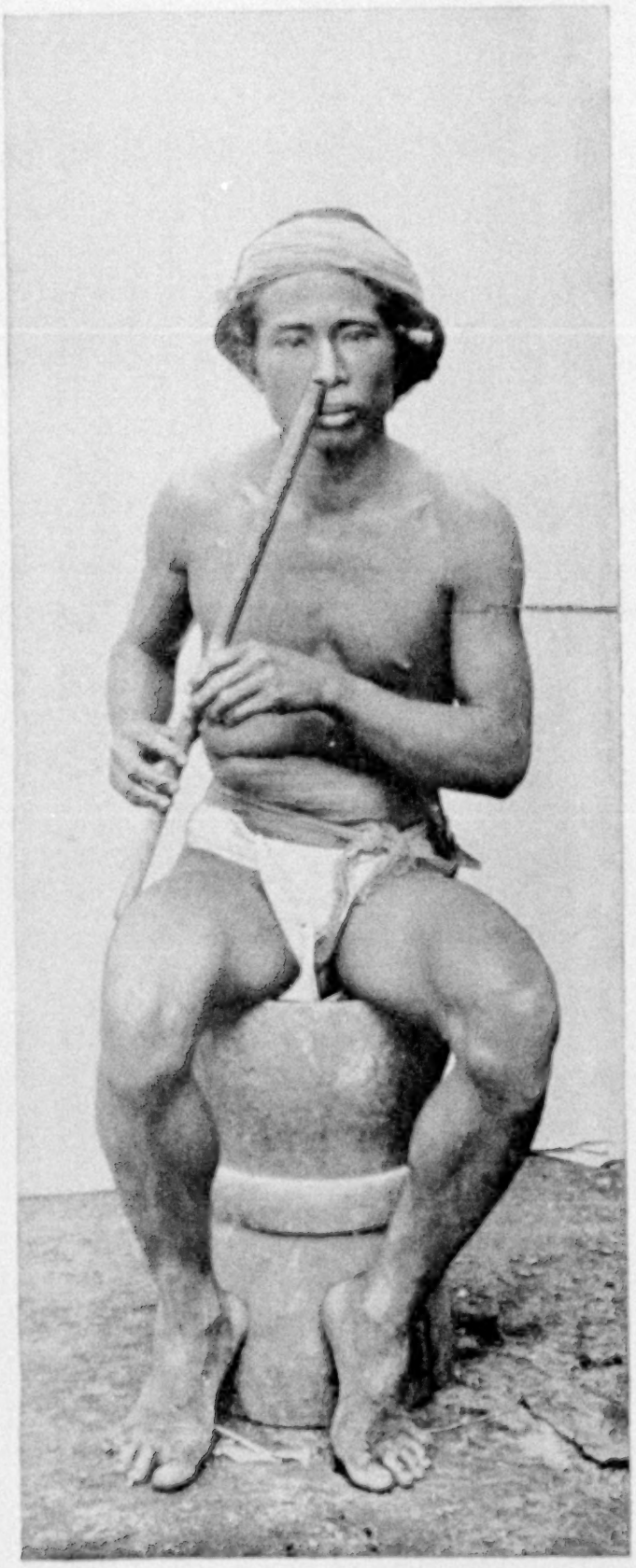
Though so savage that they were head-hunters until Americans put an end to the practice, they had developed on their mountain sides terraces that for ingenuity and laborious construction equal any in the world

and off for Lubuagan, distant 54 miles, in traveling which we shall climb and descend many thousand feet. Between 10 and 2 o'clock it will be too hot for our ponies, so we must take two days for the trip.

Late in the afternoon of the second day, while resting at Bañgad, we are met on the trail by a delegation of 29 men and one woman from Lubo. Lubo is the town that attacked former Lieutenant Governor Folkmar and got burned out for its pains. It has recently sent Lieutenant Governor Hale word that it would take his head; but Lubo says that it has finally decided to be good and is voluntarily coming to Lieutenant Governor Hale's capital, where it is likely to meet the Mangali people, with whom it has been fighting within a few weeks. There is a suspicious circumstance about the makeup of this party. It includes but one woman. War parties take *one* woman with them; friendly parties take *two!*

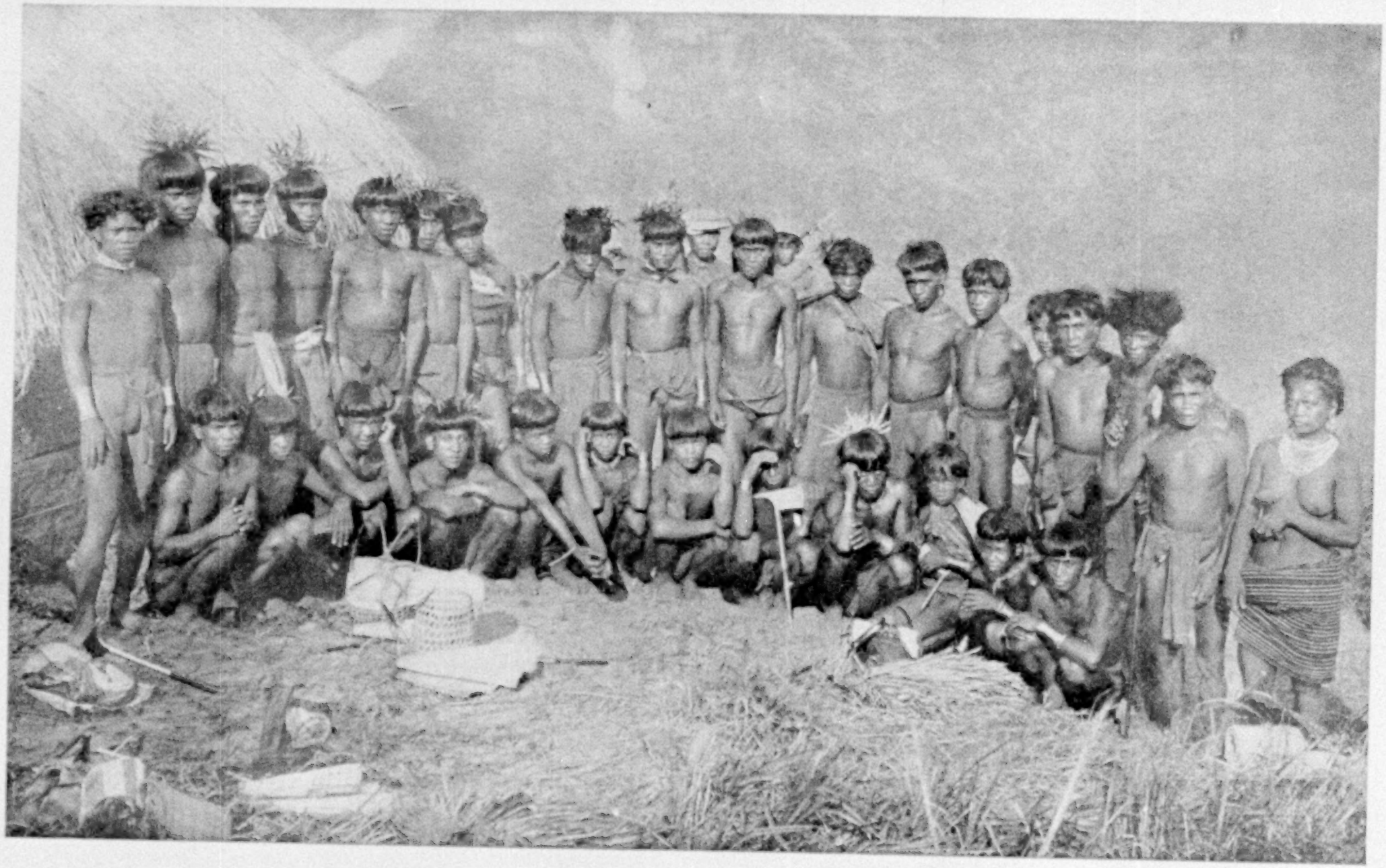
As we continue our journey the Lubo men fall in behind us, and we keep a sharp eye on them. We reach Lubuagan after dark and are escorted into town by Igorots who have come out in the rain with torches to meet us. There are but few people about the plaza when we awake in the morning, but more come in rapidly, and by the time breakfast is over dancing has begun. The Lubuagan Igorots are probably of the same tribe as their neighbors of Bontoc on the south, but differ from them materially in dress and in ornaments. The leading men of the Lubuagan Igorots wear elaborate and beautiful feather head-dresses and rattan caps ornamented with agate beads. Frequently, also, they stick scarlet hibiscus flowers into their hair. The women wear handsomely woven and brightly colored skirts, supported underneath at the waist by numerous coils of braided fiber cord. Some of them also wear upper garments, which they usually discard when they dance.

The dancing is better than any we have heretofore seen. Eighteen *gansa* players enter the circle at once, and 30 or 40 women and girls join them, danc-



A TINGIAN PLAYING THE NOSE FLUTE

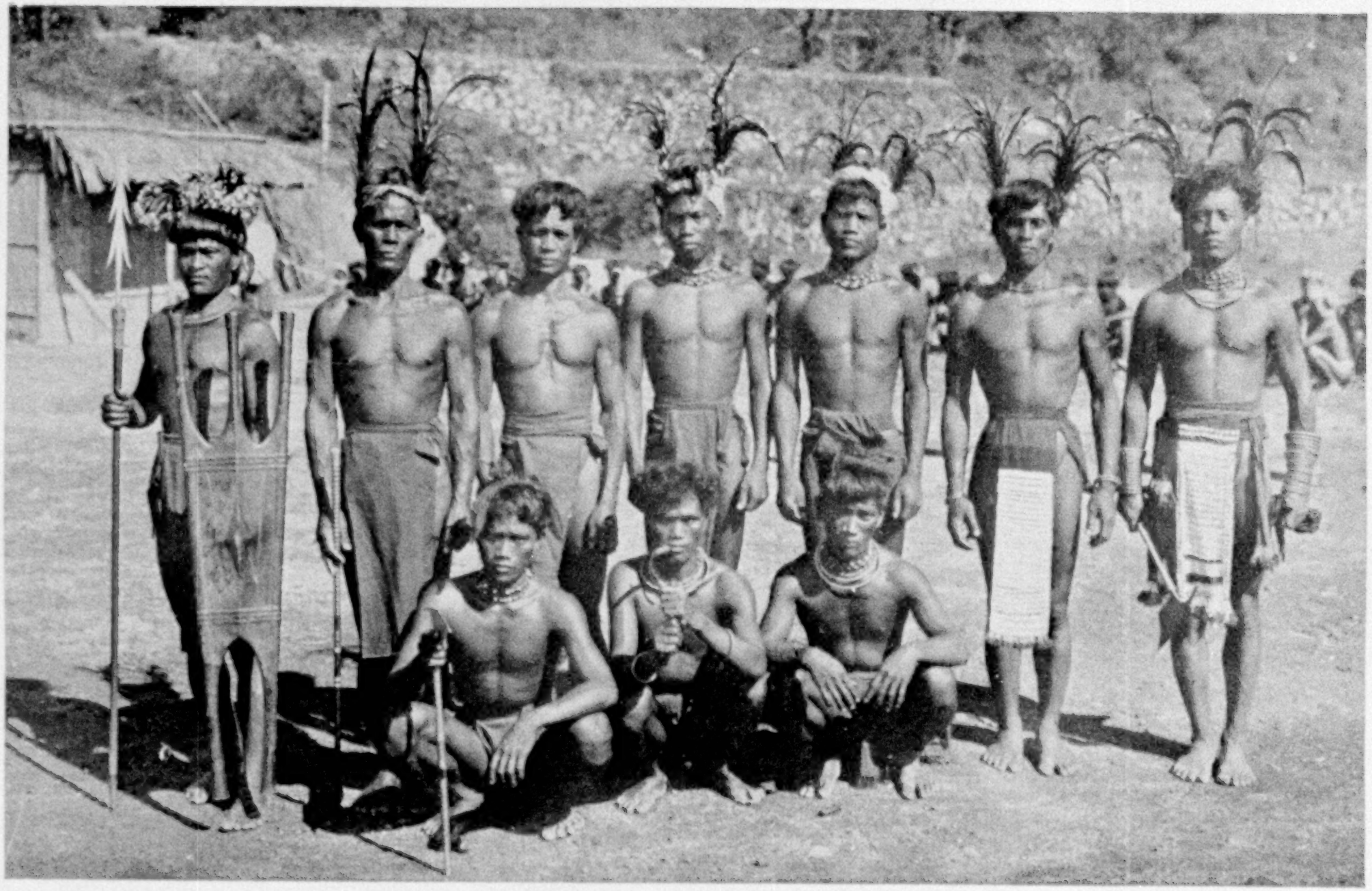
Of the many remarkable musical instruments in use in the Philippines, the nose flute is one of the oddest.



THE DELEGATES FROM LUBO WHO ARE COMING TO A CONFERENCE WITH SECRETARY WORCESTER FOR THE FIRST TIME

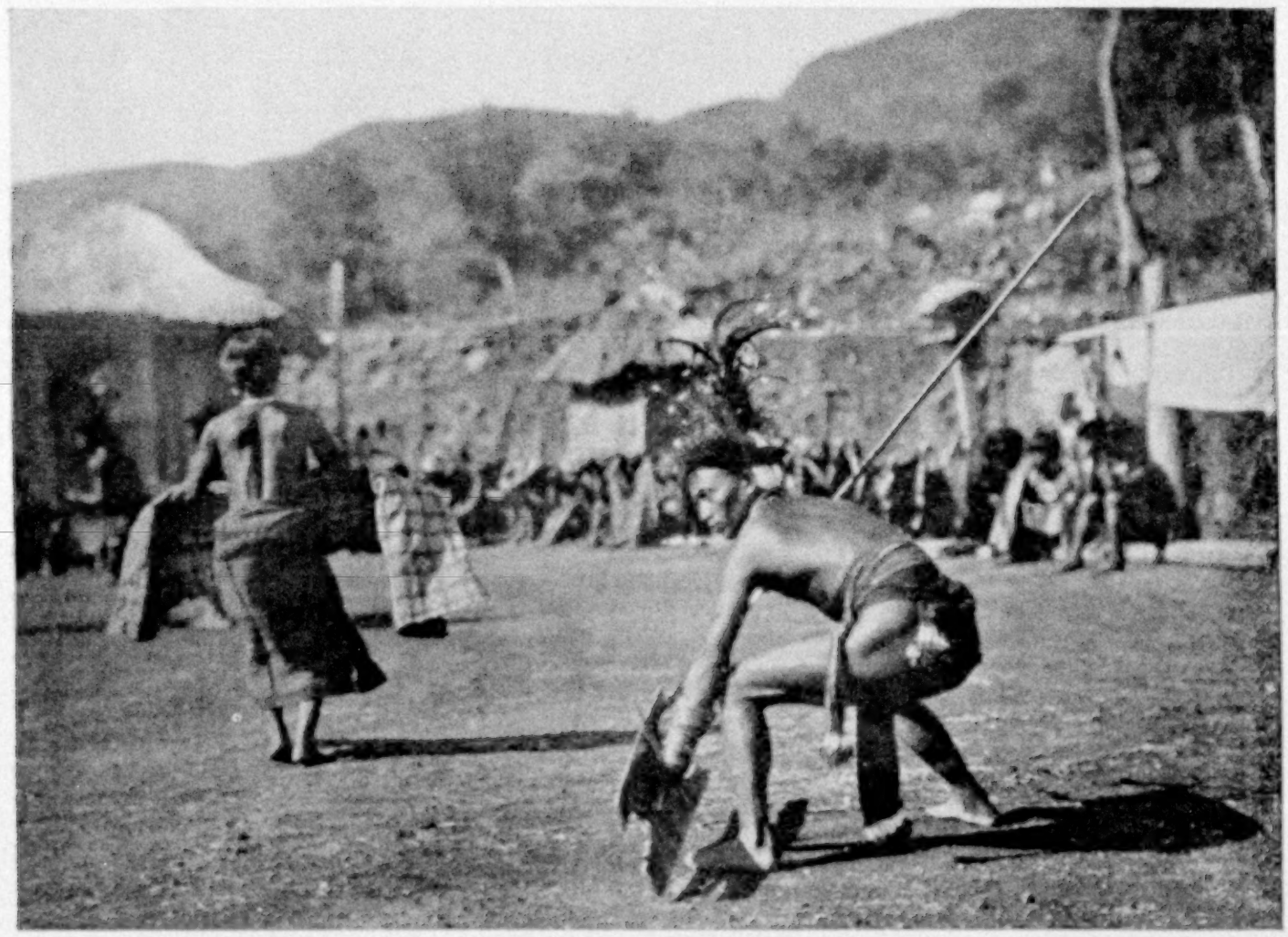
They brought only one woman with them, which was a suspicious circumstance, as war parties take one woman, while friendly and trading parties take two (see page 247)

THE HEADMAN OF LUBO AND HIS WIFE (SEE PAGE 248)



BONTOC IGOROTS OF LUBUAGAN

These are picked men, who dance for their town on festal occasions. Note the muscular development of their chests. The man on the extreme right holds a head axe in his right hand



THE DANCING MASTER AT LUBUAGAN

ing with the light, springing steps and upturned hands of the Bañgad girl whom we saw at Bontoc.

LUBO AND MANGALI MAKE FRIENDS

At this stage of events the Mangali delegation suddenly and unexpectedly appears on the plaza *armed*. Mangali is another town that said it would not come in, and its representatives have now shown bad taste in coming fully armed into a crowd of unarmed men. After they have been received in a friendly manner, their attention is called to this fact, and they retire in a shamedfaced way, leave their arms in a safe place, under guard, and return to dance before their enemies of Lubo, who in turn dance before them. When they first appear, Lubo wants to leave, but is refused permission. After Lubo has danced, Mangali wants to leave, but permission is again denied.

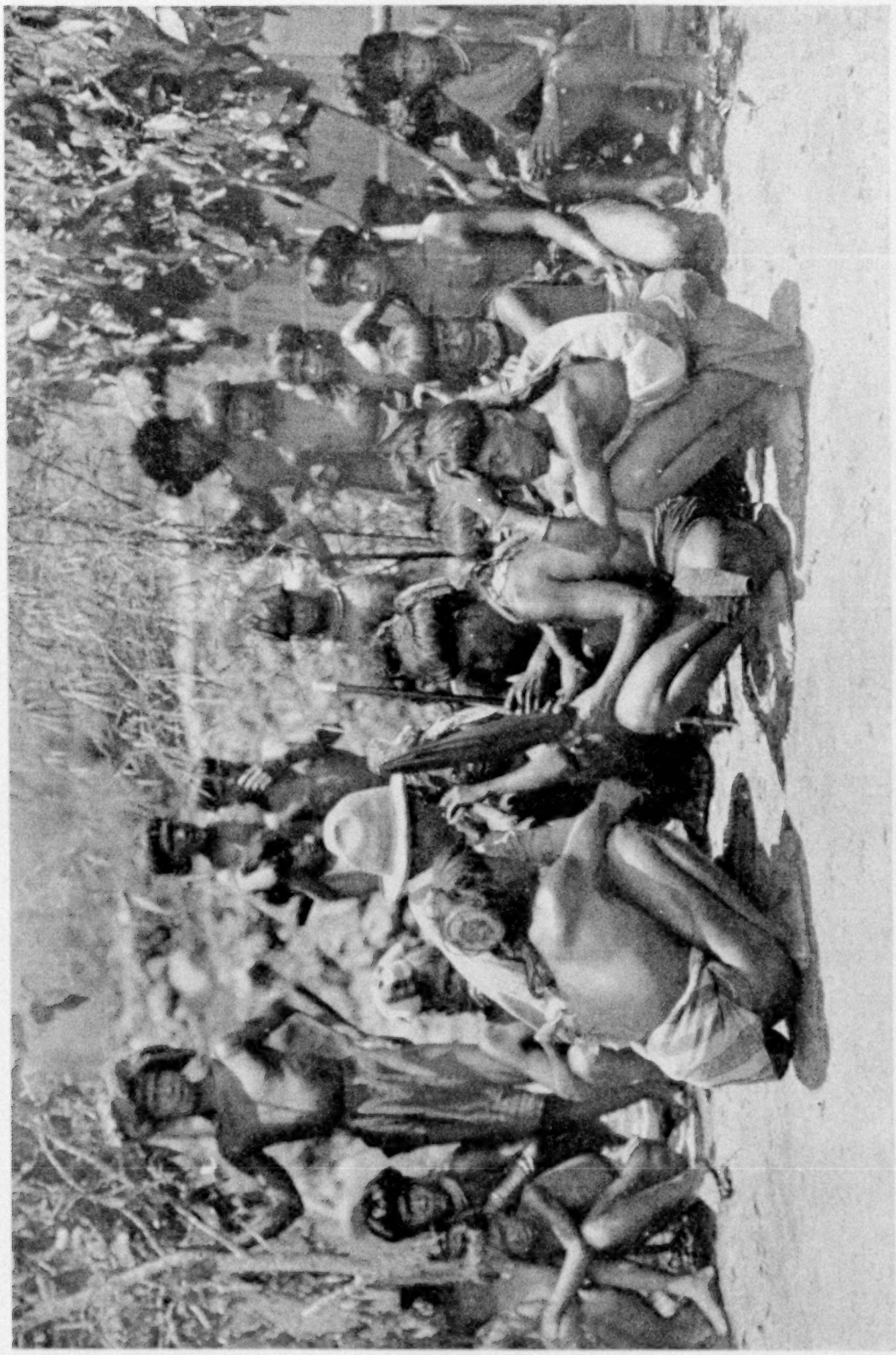
The fact is that the men of Mangali and Lubo have never before seen each other except over the tops of their shields when lances were whizzing through the air. At first they glare at each other menacingly, but as the day wanes the general spirit of good cheer has its effect and they become less hostile. Finally the two chiefs, each with a few followers, approach each other, squat on the ground, and begin to talk. Lieutenant Governor Hale uses this favorable opportunity to intervene, and before the discussion ends Mangali and Lubo have formally agreed to make peace on the morrow. Thus a bloody feud, which has lasted for no one knows how long and has cost many lives, is ended.

THE IFUGAOS

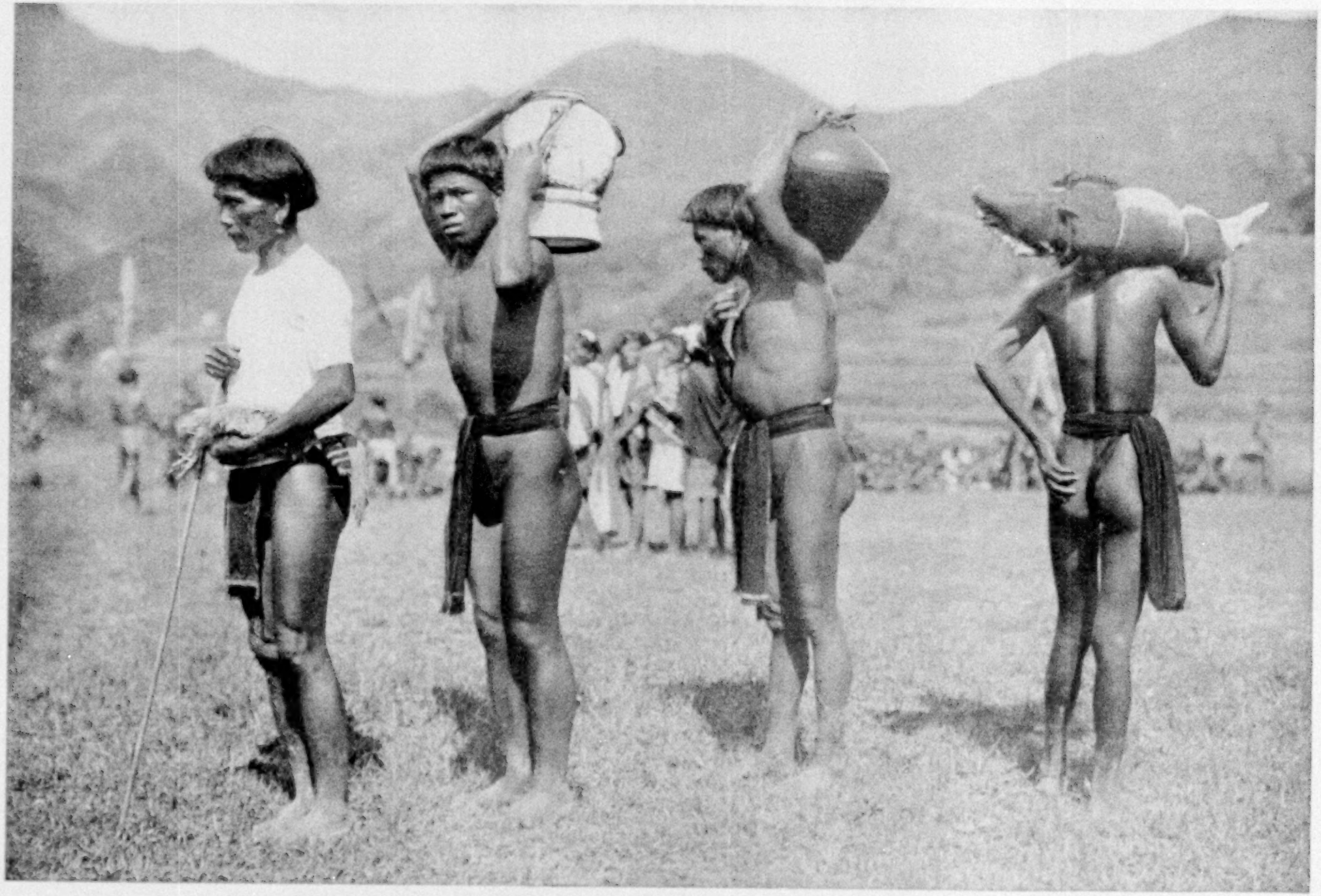
We now retrace our steps to Bontoc and thence proceed to Banawe, the capi-

A CONFERENCE WITH KALINGA HEADMEN AT LUBUAGAN

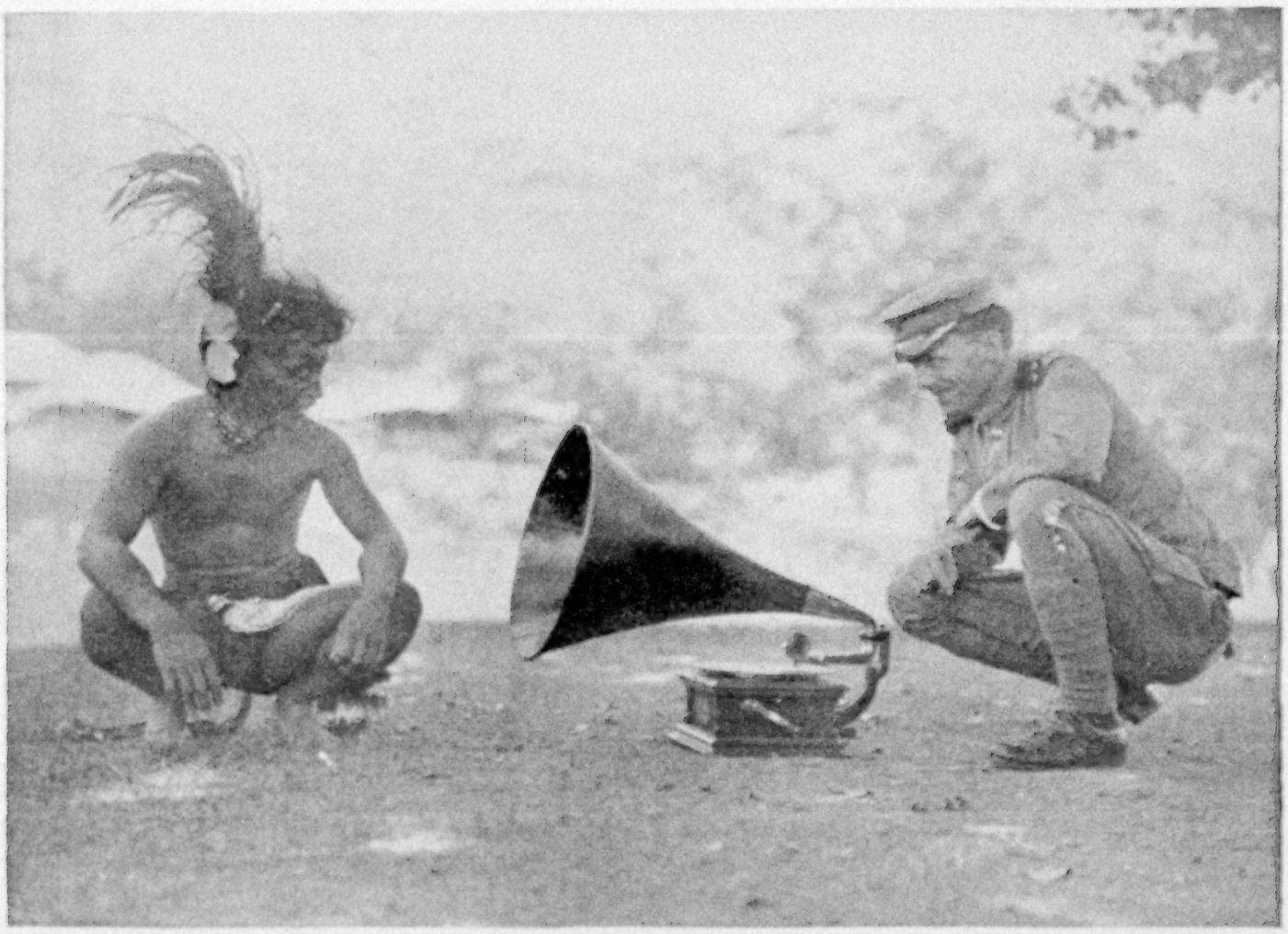
Chief Atumpa is speaking. A Kalinga warrior is pouring *basi* from the bamboo in which it is kept, and the Kalingas will soon ask the American officials to show friendship by drinking with them



LIEUTENANT GOVERNOR HALE MAKING PEACE BETWEEN THE TOWNS OF MANGALI AND LUBO; NOTE SITTING POSTURE
(SEE PAGE 251)



IFUGAO CHIEF COMING IN BRINGING THE USUAL GIFTS TO MAKE FRIENDSHIP, A WHITE CHICKEN, SIX EGGS IN HIS OWN HAND, JUGS OF BASI, AND A PIG THROWN IN FOR LUCK



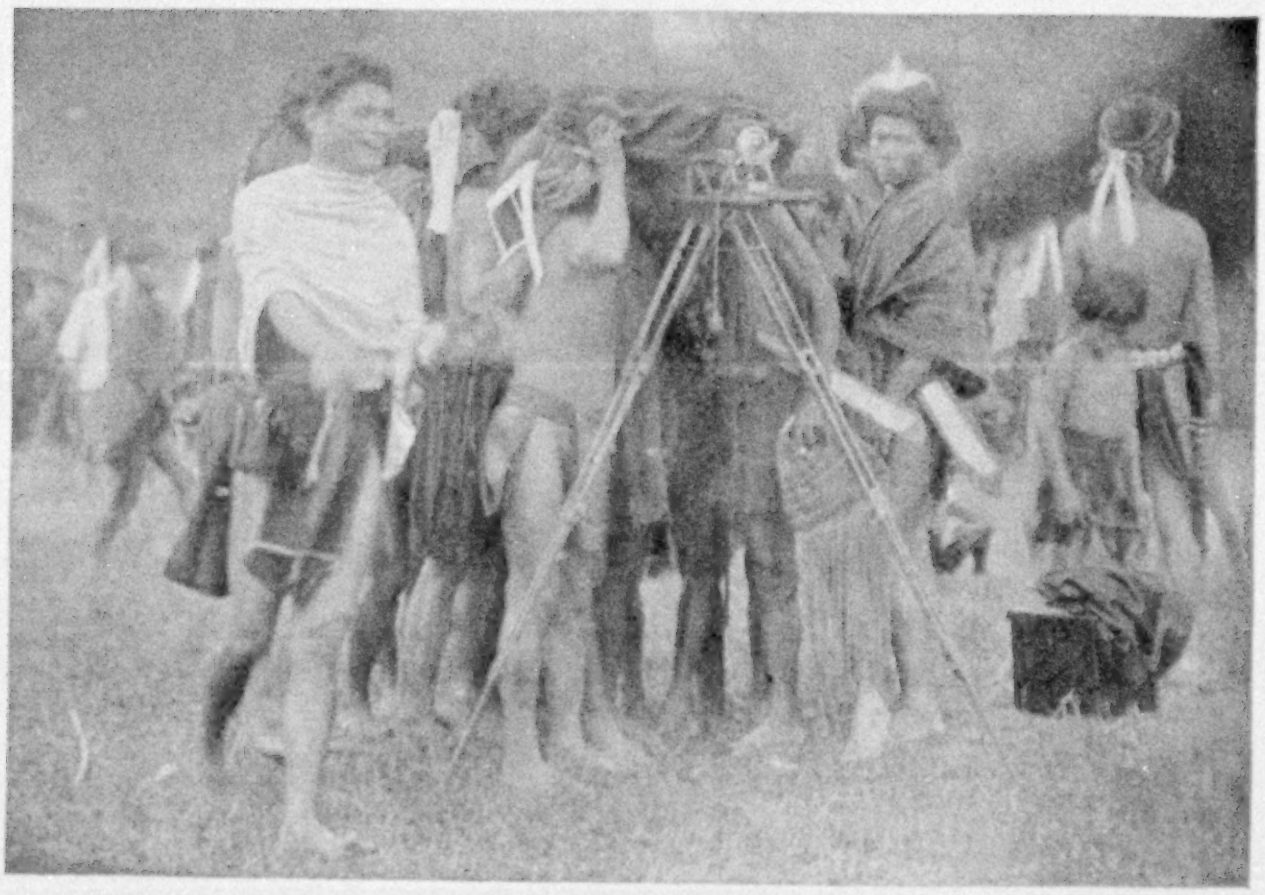
LISTENING TO THE TALKING MACHINE

tal of the subprovince of Ifugao, passing en route over the crest of the Polis range at an elevation of 6,200 feet on a trail which for many miles runs through a magnificent forest.

At the edge of this forest, on the eastern slope of the mountain, we are met by a delegation of Ifugaos, short-haired barbarians who until very recently have been inveterate head-hunters. Having shown their friendship by giving us a drink of *bubud*, they precede us, their headman carrying an American flag. He is followed by three *gansa* men, who play march music, to the tune of which we continue our journey. The country is thickly settled and each village sends out its flag-bearer and *gansa* men to escort us to the next. The trail runs along the steep mountain-side among the terraced rice fields of the Ifugaos, which are one of the wonders of the Philippines. When we sight the plaza at Banawe it is filled with a solid mass of humanity, which forms a great splotch of brown and black, relieved only by the white roosters' feathers and strips of white paper which the Ifugaos so dearly love to wear in their hair. There are no gay colors here. Clouts and blankets are of dark blue or black cloth, at the most with white stripes or small scarlet figures.

Again we are greeted by a tremendous shout, instantly followed by a sound of a very different nature. We could shut our eyes and imagine that we are at a football game, for a genuine college yell, given with a snap and vim that would do credit to Harvard or Yale, is ringing in our ears. "Wáh-wah, wáh-wah, wáh-wah, yi-i-i-i" shouts the crowd, and then it repeats the performance, trying to make a little more noise than it did before.

Dancing begins the moment we arrive and keeps up continuously throughout



MAKING THE ACQUAINTANCE OF THE CAMERA

the following night. It is strikingly different from anything we have seen before.

They dance in a circle, stamping smartly and showing great skill in their foot-work. First the left arm is stretched forward, while the right is extended backward; then this arrangement is reversed. Again one arm extends forward while the other is bent so that the hand comes just below the corresponding breast. As the dance progresses the arms are flexed and the hands and fingers moved in a manner that defies description, but some idea of it can be gained from the accompanying illustrations.

The crowd is soon increased to at least 3,000 by new delegations, each of which marches in to the tune of *gansa* music, sticks the handles of its lances into the ground, and comes forward to "present" to the authorities. The headmen bring their bottles or jars of *bubud* and their presents of chickens and eggs. The Ifugao is a great fellow to save documents, and preserves all scraps of paper on which his name is written. He insists upon your reading each of them, so that you may know who he is and what he has done.

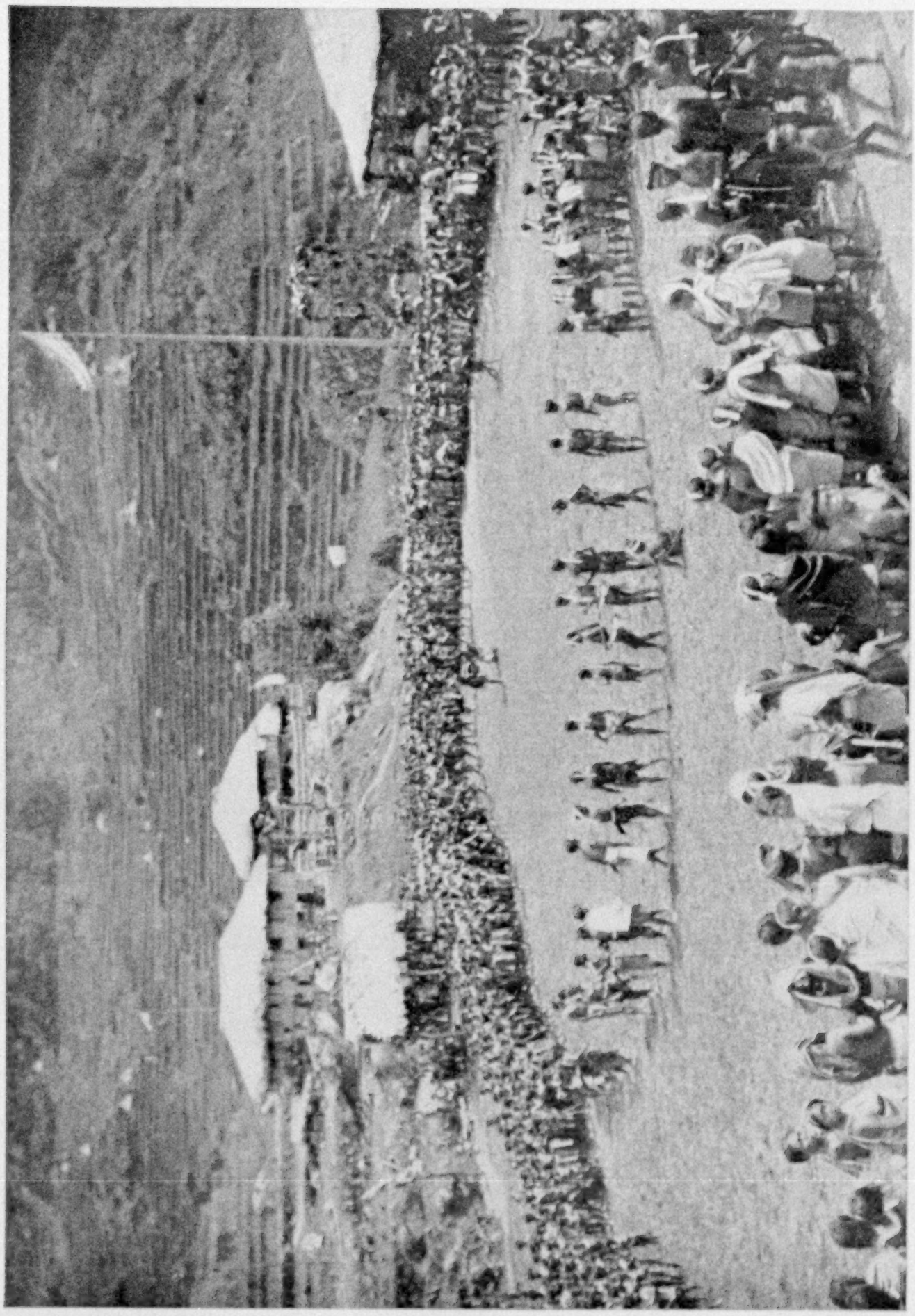
In addition to dancing, we have lance-throwing and wrestling, but no foot-races or other American sports, as the Ifugao is conservative and prefers to celebrate his holiday in his own way.

KILLING THE CARABAOS

Our next stop is at Kiangan. Here the program is similar to that at Banawe until we come to the meat distribution, and then we witness an extraordinary and bloody spectacle. The Ifugao is crazy for meat and especially for carabao meat. He has pigs and chickens, which are reserved to be eaten on festal occasions, but he keeps no cattle or carabaos. When a very rich Ifugao is going to give an especially important feast, he sends down into the Christians' country and buys one or two old carabaos. These he presents to his assembled friends, who

TWO JOLLY IFUGAO DANCERS

The right is the daughter of Mataag, one of the most famous head-hunting chiefs of Northern Luzon



THE IFUGAOS DANCE IN A GREAT CIRCLE, STAMPING SMARTLY AND SHOWING GREAT DEXTERITY IN THEIR MOVEMENTS (SEE PAGES 260-261)

IFUGAOS DANCING ROUND A SACRED IMAGE

dispose of them in the savage manner we are now to witness.

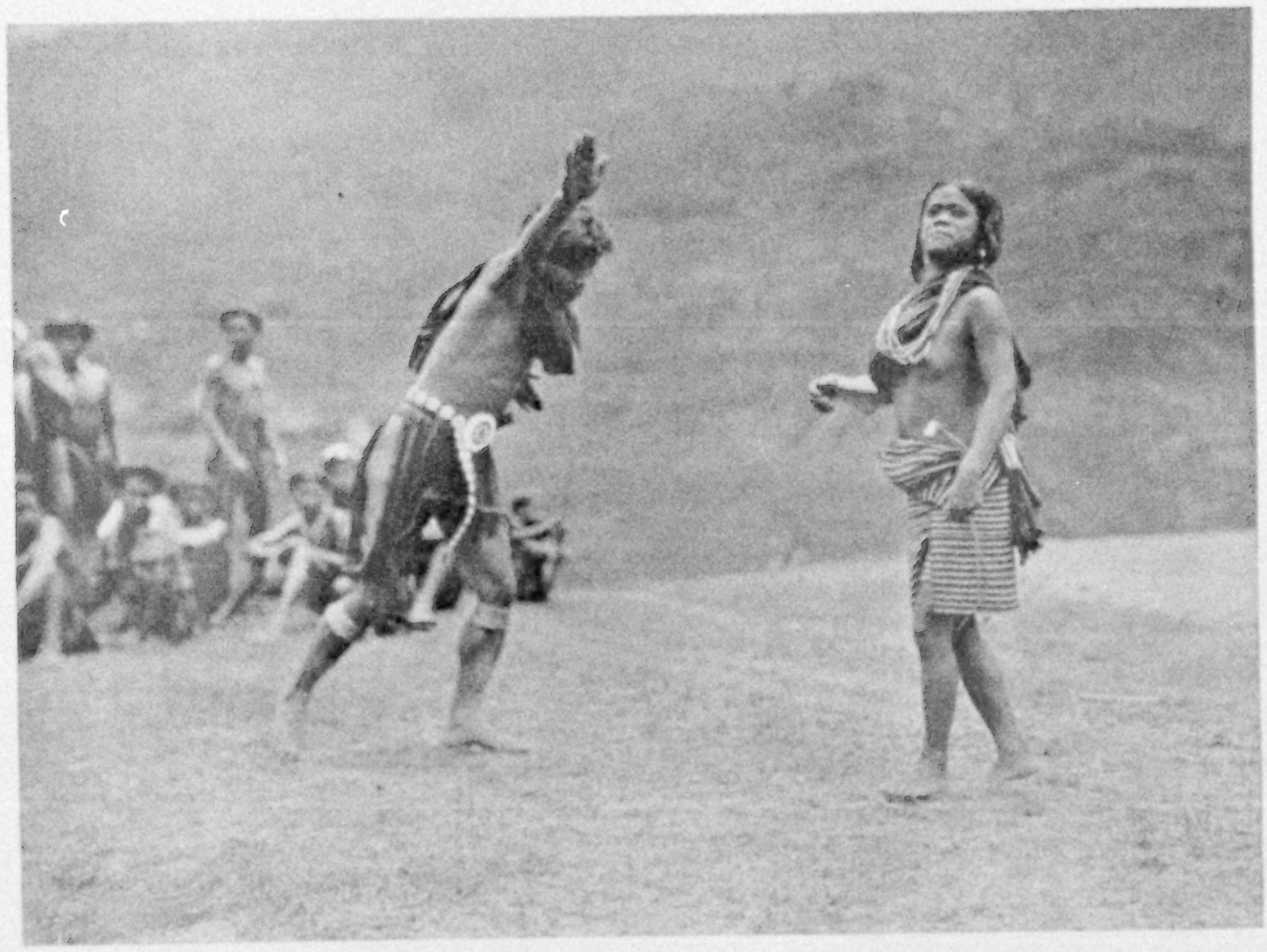
A tough old carabao is led out on the plaza, surrounded by a score of experienced and wary warriors, each armed with a sharp, heavy bolo. They have need of daring and skill at the outset, for a wounded carabao is an exceedingly dangerous animal. Back of the bold few who are to cut the poor beast down there is a solid wall of men with drawn bolos, ready to rush in, chop the victim to pieces, and struggle for the meat. The man who is leading the carabao drops the rope and strikes him a heavy blow on the neck, trying to sever the spine. He fails and springs aside as his victim turns and lunges viciously at him. Two other men rush up from behind and try to hamstring the now infuriated beast. They, too, fail; but as he whirls to attack his new enemies a swarm of men beset him and rain blows on every part of his body. Down he goes, and the crowd rushes in on him with a roar.

Some men lie flat on the ground and cut and hack; on these others kneel, chopping away for dear life, while those who stand farther back bend forward and strike with their bolos. One fortunate individual manages to cut off the carabao's tail. Half a dozen others instantly lay hold of it, and, fighting vigorously for its possession, they push through the crowd, perhaps only to roll down a steep bank into a thicket of

Note their knives or bolos

"The arms are flexed and the hands and fingers moved in a manner that defies description"

IFUGAOS DANCING AT BANAWE



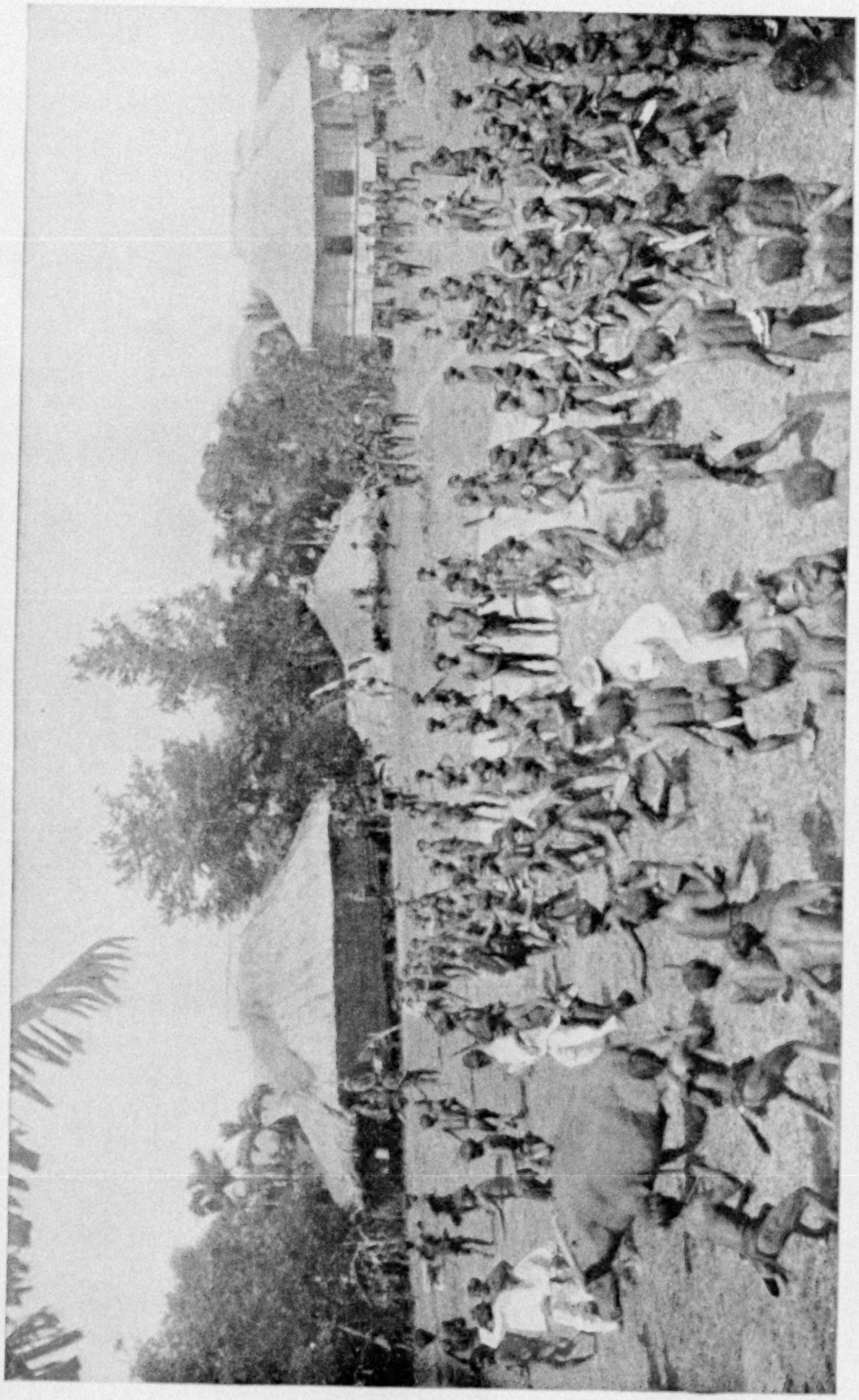
IFUGAOS DANCING; THE WOMAN HAS BEEN "SAUCED" BY THE CROWD AND IS TALKING BACK

thorny undergrowth, where they pull, tug, and threaten each other until all are tired out and one is able to get away with the tail, or until an agreement to divide it is reached. When a man has once placed a bit of meat on the ground he will not be further molested, but may turn it over to some less vigorous companion to keep for him, or stick it on the point of his lance, which he has previously thrust into the ground, point up. This done, he rushes back for more meat.

Before the carabao is through kicking his intestines have been torn out and the crowd has a tug-of-war with them, each individual retaining what he can get. When such a mob of people hacks recklessly with war-knives, it is inevitable that severe wounds should be accidentally inflicted. In every scrimmage a number of men are badly cut, but they accept their misfortune with absolute good nature, merely shrugging their shoulders and saying that it was their "*buni*," or luck. No ill-feeling is shown or felt on account of wounds received in a struggle for meat. If the Ifugaos were not extraordinarily skillful in the use of their war-knives serious injuries would be much more frequent. With half a dozen men tugging at a small piece of meat, I have seen an outsider neatly halve it with a single blow, and this without wounding any one!

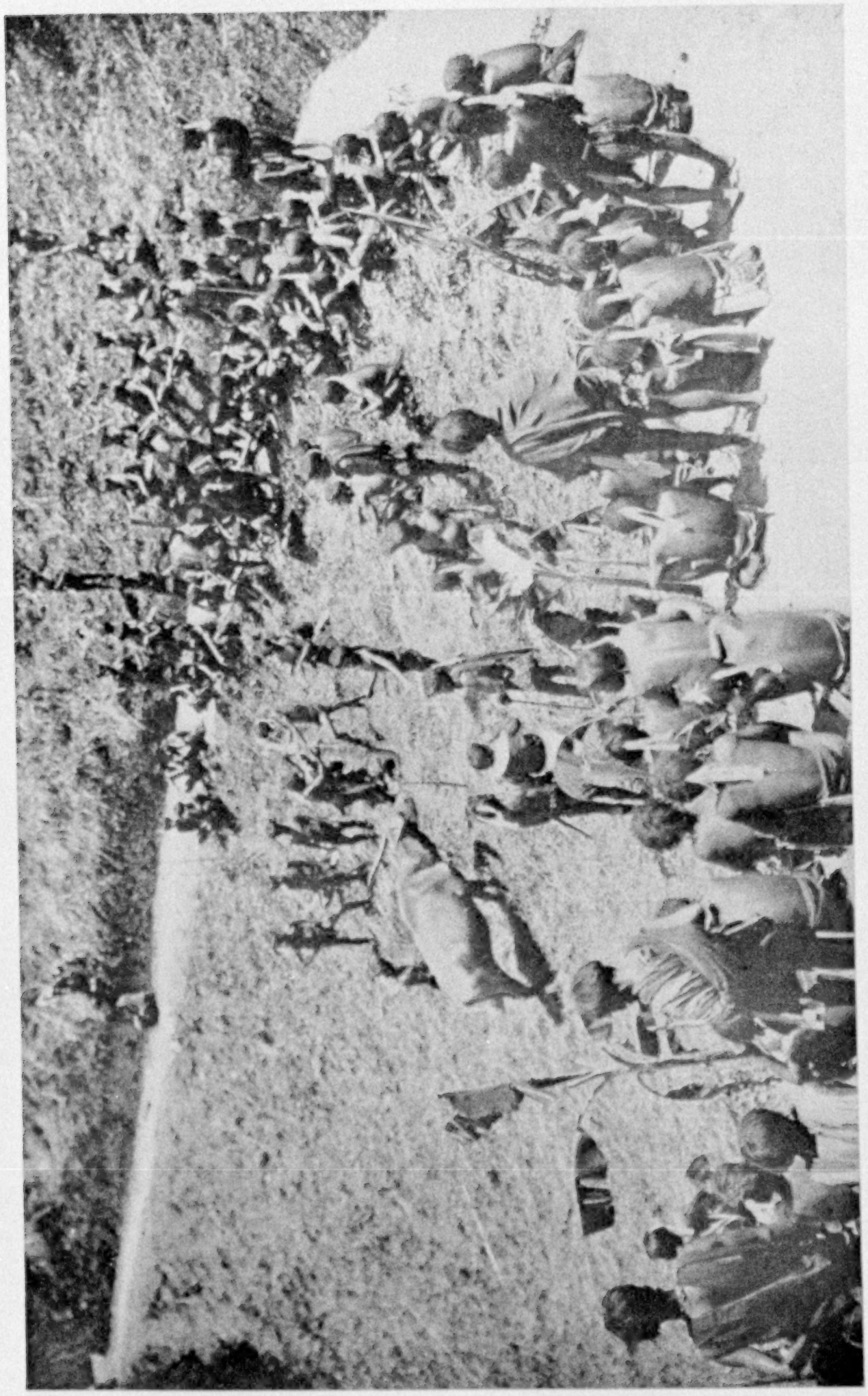
In ten minutes from the time the carabao is turned loose he has completely disappeared, having been chopped into bits and carried away. Nothing remains save a pile of partially digested fodder from his stomach, and small boys are hunting through this for stray bits of meat. The next victim is now led out.

We emphatically disapprove of turning



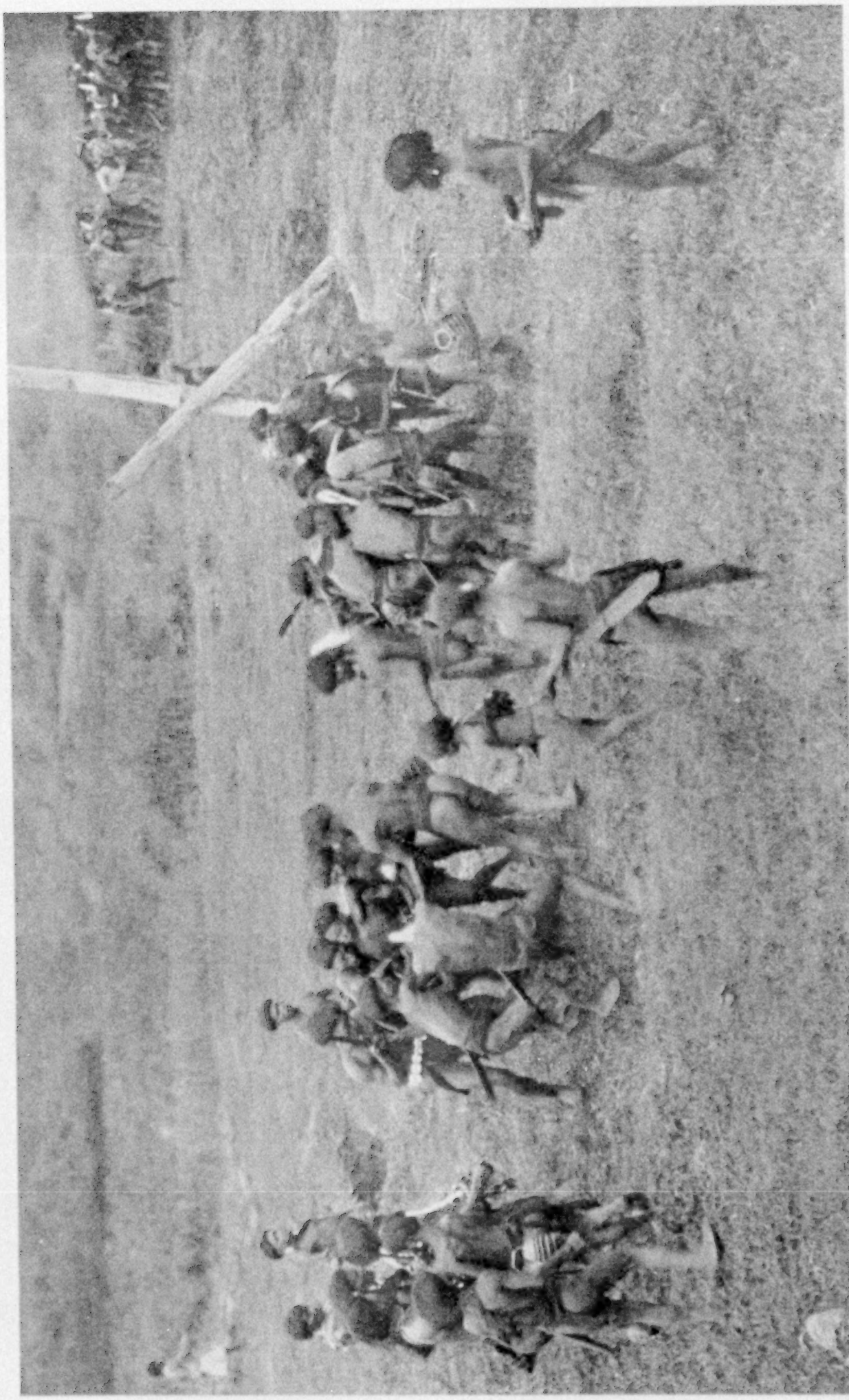
LEADING OUT A CARABAO TO BE TORN TO PIECES (SEE PAGE 259)

Note that almost every man is expectantly flourishing a bolo

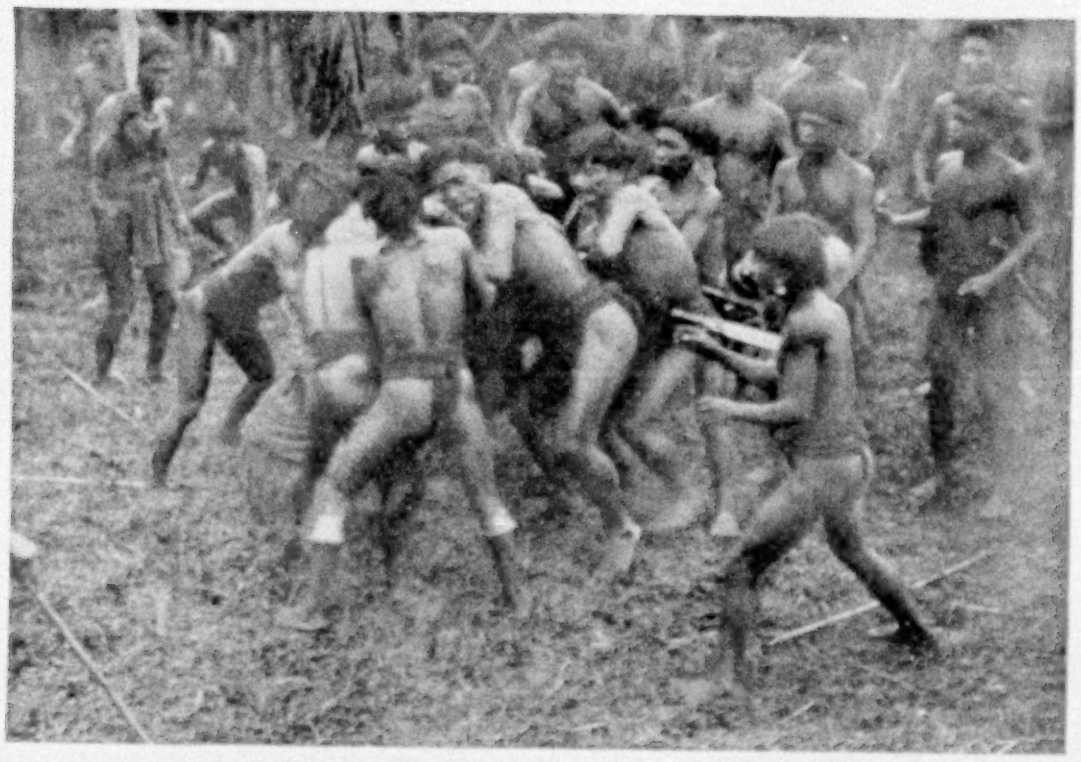


AN IFUGAO CHIEF PRESENTING A CARABAO TO HIS FRIENDS WITH THE WORDS "HELP YOURSELVES"

"Some men lie flat on the ground and cut and hack; on these others kneel, chopping away for dear life, while those who stand farther back bend forward and strike with their holos" (see page 259)



FIGHTING FOR PIECES OF THE CARABAO: THE MAN ON THE EXTREME RIGHT HOLDS A GENEROUS PIECE AND IS WATCHING FOR AN OPPORTUNITY TO SNATCH SOME MORE



FIGHTING FOR A SINGLE PIECE OF THE CARABAO

him loose, and insist that he shall be killed with an axe. The Ifugaos agree to make this concession to American prejudice. He is knocked down and the usual scrimmage follows. Meanwhile the men wounded in the first melée have come to have their cuts sewed up and bandaged, for they have already learned to have great confidence in the white man's medicine and surgery. They are sure that we must be good Ifugaos and brothers, because we are willing to do them this service. Before we have finished with the first lot of wounded, hundreds of men and women are squatting around us and showing their appreciation by singing to us the Ifugao love song.

One after another the carabaos meet their fate, and one after another the different delegations go marching off to the tune of *gansa* music, each taking with it a goodly supply of meat for women and children at home, who perhaps may never before have tasted any.

The next day we continue our journey, dropping down from the mountains to the Christian town of Bagabag, in Nueva Vizcaya, escorted all the way by Silipan Ifugaos, who were the terror of the Spaniards; who annihilated an entire garrison at Payoan, on this very trail; who exacted a heavy annual toll of heads from the people of Bagabag, and who made the main trail from Nueva Vizcaya to Isabella so dangerous that three strong garrisons were constantly maintained on it, and that people were not allowed to travel over it except under military escort, and even so were often attacked and killed.

At Bagabag we receive an enthusiastic reception. The people of this town are more than grateful, because the government has made their lives and property safe. They will tell you that the Ifugaos believe the Secretary of the Interior, Lieutenant Governor Gallman, and Lieutenant Meimban to be genuine gods, recently reincarnated. In no other way can these Christian Filipinos explain the fact that we have been able to cause 120,000 head-hunters to give up head-hunting and to leave them in peace! In point of fact the Ifugaos believe nothing of the sort, but they *are* convinced that we are pretty good Ifugaos, and they have the best of reasons for knowing that we are their friends.

We have been able to get results in dealing with wild men by following the

simple policy of always giving them a square deal; by not punishing them for a given course of action unless they had had ample previous warning that such action would be followed by punishment; by never failing to punish them when, *after due warning,* they have misbehaved; by making friends with them again whenever they were ready to be friendly, and by finding an outlet for their superabundant animal spirits in rough but innocent field sports.

IN HONOR OF THE ARMY AND AVIATION

THE sixth annual banquet of the National Geographic Society, which was held on January 14, was probably the most notable banquet in the history of the Society. In addition to the President of the United States and the ambassadors of Great Britain, Germany, Mexico, and the Ottoman Empire, there were members present from 37 States and from many foreign countries. The dinner was in honor of the United States Army and of the discovery of the art of aviation, the principal guests of honor being the officers of the Army and Mr. Wilbur Wright. Announcement was made during the evening of the election of President Taft as honorary member of the Society in recognition of his effective promotion of and interest in geographic science. The Society now has five honorary members, as follows: William H. Taft, Theodore Roosevelt, Robert E. Peary, Fridtjof Nansen, and George Dewey. Mr. Henry Gannett, President of the Society, presided, and Gen. John M. Wilson, formerly Chief of Engineers, U. S. Army, acted as toastmaster.

Through the courtesy of the Department of Agriculture, the guests and members of the National Geographic Society had the opportunity of testing a new plant recently introduced by the explorers of the Department. The new vegetable was the dasheen, which, instead of potatoes, was served with the filet of beef. The dasheen is one of the principal foods of rich and poor in the Orient, the Pacific Islands, Africa, and the West Indies. By many connoisseurs it is preferred to the potato. The introduction of this popular tuber is important, because the plant can be grown throughout the Southern States and as far north as Washington. It is capable of becoming a profitable industry on many lands which are too wet for the growing of potatoes. The office of Foreign Seed and Plant Introduction of the Department of Agriculture will be glad to give information to all persons interested in this newly imported vegetable.

The addresses of the evening are printed in full as follows:

PRESIDENT GANNETT

It gives me much pleasure to welcome this gathering here tonight. It is true of all societies that the membership moves slowly at first, but lately the Society has been growing by leaps and bounds. A year ago the membership numbered 53,000. Today it numbers 74,000—an increase of 21,000 in a year. It publishes a monthly magazine, and those who are competent to judge say it is a very good magazine. It maintains a course of weekly lectures here in Washington, and those I know are good, because they are always crowded every night and people are turned away. It has given a number of medals for achievement in geographic science and exploration. It has sent an expedition to Alaska to explore the mountains and volcanic regions and scenic phenomena. And, finally, it gives an annual banquet. Now, ladies and gentlemen, I have great pleasure in introducing to you the toastmaster of the evening, General Wilson.

THE TOASTMASTER, GEN. JOHN M. WILSON

Mr. President, Ladies and Gentlemen:
In a long military life of over 55 years

DASHEENS DUG FROM A SINGLE HILL AS THEY LOOK BEFORE COOKING

in the service of my country, many honors have been conferred upon me, but none have been greater than that of having been selected as toastmaster at this superb gathering of beautiful women and eminent men.

Modern war demands that campaigns shall be short, sharp, and decisive, and we are looking forward to the happy millennium when the speeches of toastmasters shall be of the same character.

In presenting the distinguished speakers of the evening I shall detain you but a few minutes, for I have learned the lesson of brevity on such occasions from eminent authority.

During the two administrations of that magnificent citizen and statesman, the late President Cleveland, whose constant thought was for the welfare and prosperity of this nation, I was honored by being selected as his military aide; and, on one occasion, when he was about to send me off on a duty requiring tact and diplomacy, he talked with me for nearly half an hour, fully explaining his views on the subject. Rising to leave him, I had reached the door of the library when he called, "Colonel!" Turning and saluting, I answered, "Yes, Mr. President." Whereupon he added, "Let the other fellow do the talking." That is what I propose to do tonight.

Again, while Superintendent of the United States Military Academy, on one occasion I invited that wonderful humorist and raconteur, Mark Twain, to visit West Point and address the cadets. He was my guest at my home, and, at dinner, being desirous of finding out how long he would talk, so that I might give the necessary order as to the hour for sounding "tattoo," I said to him, "Mr. Clements, about what time tonight will you finish your address?" With that inimitable drawl so well known to his friends, he replied, "That depends, sir, upon how long you take to introduce me. Some fellows take half an hour." I promised him I would not exceed three minutes, and I propose to keep myself within the same limits tonight.

We have with us this evening the Ambassador from the great Empire of Germany, a nation renowned for its achievements in peace and war; a nation which has reached the highest round of the ladder of fame in the arts and sciences—in fact, in everything that represents the highest culture; a nation

THE DASHEEN IS A HANDSOME PLANT WITH ITS LARGE SHIELD-SHAPED LEAVES

A FIELD OF DASHEENS IN SOUTH CAROLINA

which has given to the world such superb soldiers as Frederick the Great and von Moltke; a nation whose great Emperor has managed the affairs of state so grandly, and who, although inheriting from his noble ancestors all the qualities of a splendid soldier, has nevertheless done so much towards maintaining peace in Europe during the past decade.

It gives me pleasure to present to you His Excellency Count von Bernstorff, the Ambassador from the Empire of Germany.

THE GERMAN AMBASSADOR, COUNT J. H. VON BERNSTORFF

Mr. Toastmaster, Ladies and Gentlemen: I wish to thank you most sincerely for the kind invitation to this splendid banquet. We diplomats in this most hospitable of all countries of the world become experts in banquets, so that if I say it is a splendid banquet I hope it will convey the superlative to you. It is a great honor and a pleasure for me to meet here tonight one of your most celebrated compatriots—a man who has done more than anybody else in the world to promote aviation.

There is only one disadvantage for us ambassadors, if we are honored and have the pleasure of attending a banquet like this, and that is that we have to earn this honor and pleasure by making a speech. Now making a speech is not so difficult if one knows what one has to say. I do not mean to say that we ambassadors know nothing at all, but those things we do know we are generally supposed not to speak about; and it so often happens that we speak about things of which we know nothing. But I must confess that I never in my life have been asked to speak upon something I knew so little about as now, when I have been asked to speak about aviation in Germany, of which I know positively nothing.

The only experience which I ever had and which promoted my knowledge of aviation was not in Germany, but in America, about two years ago, when the long debates about the tariff kept us diplomats here in Washington until about August. Our principal form of recreation was to go over to Fort Myer and see our distinguished fellow-guest of this evening preparing for his test flight. I remember one day very well that he was kind enough to show me his machine in all details. I tried to understand as much as I could; but, to my great humiliation—we must not have been alone when he was teaching me—I remember the next morning seeing in a local newspaper that Mr. Wilbur Wright had tried to explain his machine to the German Ambassador, who did not seem, however, to understand anything about it.

Speaking of aviation in Germany, I may say that it has developed of late very much, which is perhaps sufficiently proved by the fact that Prince Henry, the brother of our Emperor, has gained a certificate as a pilot. One other proof out of many recollections I can give of the development of aviation in Germany is that only eight years ago I was coming home from a trip in Switzerland, and we crossed the Lake of Constance. When we came to the shore I saw a very great garage, which nobody seemed to know the use of. There was one person on the ship who was clever enough to tell us that that was a garage in which a mad fellow named Zeppelin was building a ship in which he hoped to be able to travel in the air. Last year, only eight years later, when I came across that same lake, I saw this same supposed madman crossing over the lake with about 20 people in his airship.

Germany has been particularly successful in developing the type of airships which are known under the names of Zeppelin, Parsival, and Gross. In the beginning the Zeppelin airship, with its rigid envelope, created the greatest enthusiasm, but since a reaction of public opinion has set in on account of several accidents which these airships have suffered. I believe, however, that this reaction is not justified. In consequence of the first successes which these airships had, the great aëronauts forgot that today the success of a trip in the air

is dependent on good weather. They started several times when the weather conditions were not satisfactory, and the results, as you know, have been several accidents. But it is to be hoped that in future, when more garages have been built and people are more careful, such accidents will not happen again.

In former times there were two names in Germany whose bearers have done much to promote the cause of aviation. One is Gottlieb Werner Daimler, who constructed the first light motor to be used in airships. Without these motors flying would have been impossible.

The other was Otto Lilienthal, of whom I can perhaps say a few words without being afraid of having it said by our distinguished fellow-guests that I have been talking nonsense. Otto Lilienthal was one of the first experimenters who used a flying machine. He constructed a very simple machine with canvas and wooden wings, and started first to dart down hills, and afterwards tried to fly through the air. These wings were at first perfectly straight. But later on, by observing the flight of birds and continuing his experiments, he found that it was necessary to curve these wings; and, after having made this experiment, he managed successfully to fly for several hundred yards. In one of these flights he died. But he wrote many essays on aviation, and I think I may say that his essays have been read and have been followed by the most successful aviators of today.

Photo by Prof. Robert W. Wood, Baltimore

OTTO LILIENTHAL MAKING ONE OF HIS LAST GLIDING FLIGHTS

Now my knowledge about aviation is really at an end. So I will sit down, thanking you again most sincerely for your kind invitation to spend this charming evening with you.

THE TOASTMASTER, GEN. JOHN M. WILSON

It has been my good fortune for the last few hours to be sitting with the most charming gentleman I have met for a long while. He represents our neighbor republic down along the Rio Grande—the land of sun and flowers, the land of

beautiful women and brave men, the country whose magnificent President has done so much for its development. It is my pleasure to present to you tonight the Mexican Ambassador, Senor Don Francisco Leon de la Barra.

THE MEXICAN AMBASSADOR, SENOR DE LA BARRA

Mr. President of the United States, Mr. President of the National Geographic Society, Ladies and Gentlemen: A very great honor has been conferred upon me in the invitation extended to me by the National Geographic Society to speak at this banquet in the presence of the President of this Republic, that great citizen, the worthy representative of the American people, who has won, in the high office he fills, the respect and esteem of all.

One cannot but admire the energy applied by this Republic, not only to the development of industry and commerce, but also to the progress of science that to so great an extent serves as the valuable aid of trade.

Among other sciences is that to which your association is devoted, a society well deserving the name of "National," because of the lofty spirit with which it harmonizes the teaching of the wise and its love of the mother-land, for whose greatness the Society unceasingly strives.

The topic which I am to discuss—"The great commercial routes of the world"—is of so vast a scope that it would be impossible for me to do it justice, even superficially, in the short time I may be allowed to occupy your attention this evening. I shall therefore limit my address to general considerations which I may be permitted to lay before you.

In the present day the science of geography is not merely a universal *cicerone*, as it was formerly considered, confining itself simply to a description of the earth's surface and its inhabitants, without bas-reliefs or color, if I may be so allowed to express myself. It has become the most suitable means of acquiring a scientific and practical knowledge of the material and social life of nations. The object of some of its studies is the solution of problems in regard to those great commercial routes of the world which have been selected for the purpose of, or rather because of the need of, shortening distances between the producers and consumers, lessening thereby the cost of transportation to the benefits of all concerned.

Thus we find in the world's history that the paths marked out by navigators and explorers who were led on by thirst for glory, or by love of the mother-land, or by the idea of promoting the welfare of humanity, have been followed by commercial people in search of wealth by exploiting or obtaining new markets.

To these tendencies, which within their proper limits we welcome as motives for the progress of humanity, is due the great movement of expansion and colonization, which began in the sixteenth century and goes on today more actively than ever.

To the financial problems, the solution of which is sought for in the lower prices and rapid transportation of merchandise, we must add other politico-social problems of no mean interest.

The Mediterranean route, which brought together India and England, has not been of benefit to commerce alone. Politics has also taken a most useful advantage of the great historical route of the Suez Canal, the influence of which has been universally felt.

The Isthmian Canal, thanks to which the eastern and western coasts of this continent will be in closer touch, not only will be of benefit to the commerce of the United States with the extreme Orient and with the South American republics, but also to the whole world. It is but natural, then, that the advantage to be derived from these great commercial highways should be felt in the most remote countries as well as in those in closer proximity to the new route.

By shortening the time necessary for transportation, both near and far lands will be benefited by lower freight rates, to the advantage of both industry and commerce.

XUM

THE ADVANTAGES OF THE TEHUANTEPEC ROUTE

The interoceanic problem in our continent was clearly defined in the first half of the sixteenth century by the Emperor and King, Charles V, and by Hernan Cortés, the conqueror. In a letter, a most interesting document in many ways, the Spanish monarch urged Cortés to do all in his power to find a route that would connect the eastern and western coasts of the New World. The captain, in reply, gave great hopes of success, adding that this would make the King of Spain lord and master of so many kingdoms that he might be properly called King of the World. This was in the year 1533.

In the midst of his occupations as warrior and governor, Cortés tried to find this passage, and explored the Coatzacoalcos River to its head-waters in the Isthmus of Tehuantepec. Finding no opening, but being aware that commerce in a more or less distant day would pass through this low, narrow region, he asked for and was granted by the Spanish Crown a concession of lands in that region, where, in his belief, the outlet would be eventually opened. His descendants still continue to hold the lands, which formed part of the marquisate of the Oaxaca Valley granted to the Conqueror.

When Baron von Humboldt visited Mexico he understood at once the great importance of the Isthmus of Tehuantepec for the commerce of the world, and gave a graphic form to his idea by calling this part of our country "The Bridge of the World."

Tehuantepec and Panama are destined to be the great highways of our continent.

"Mexico," says the eminent Reclus, "is destined to play a prominent part in the future of humanity. The Isthmus of Panama, soon to be changed to a strait, is one of the historic routes of the future; the Isthmus of Tehuantepec is also marked as one of the routes to become of universal importance."

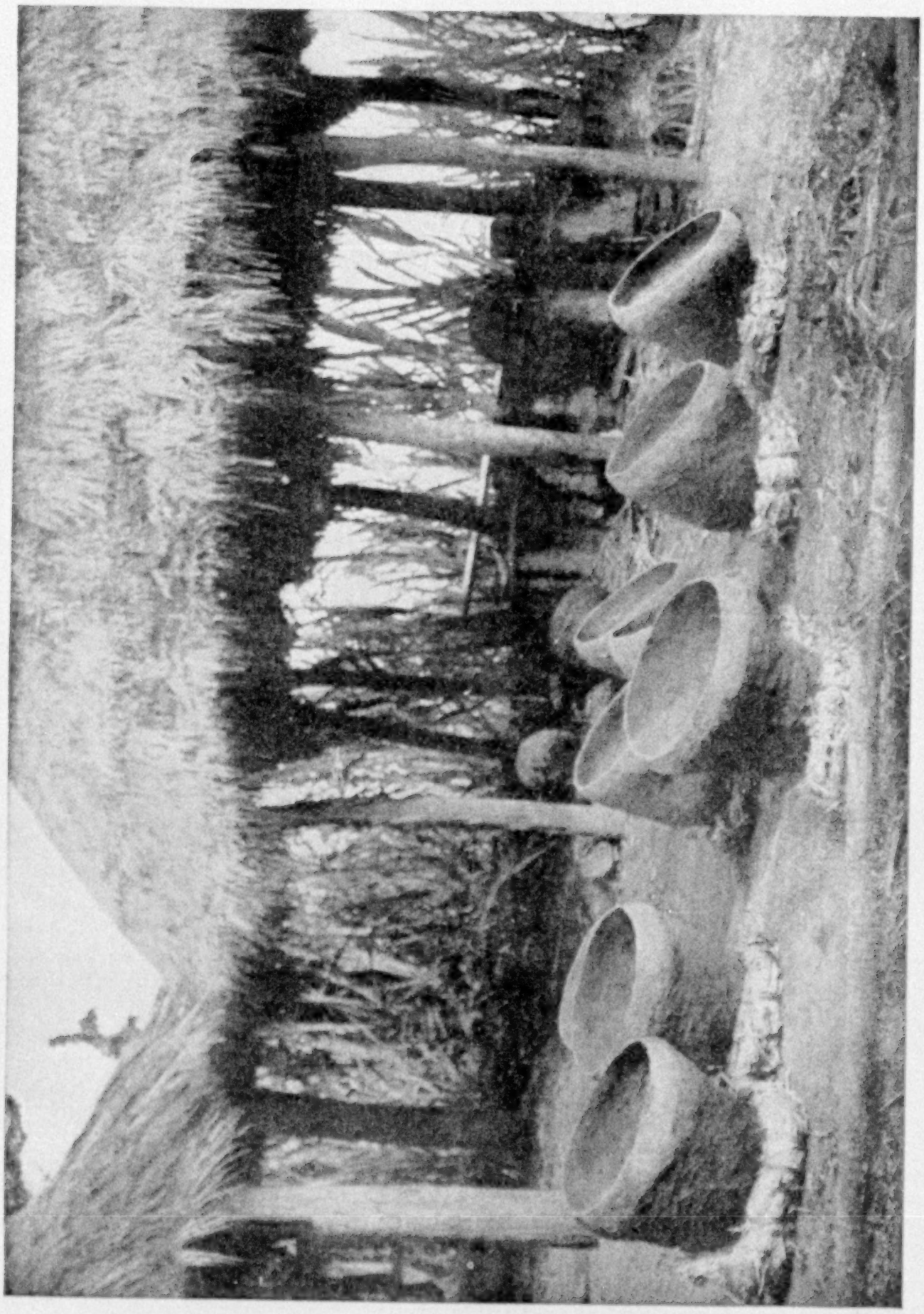
Tehuantepec already affords rapid means of transportation for passengers and merchandise by the railway, 190 kilometers in length, lying between Salina Cruz, one of the best ports of the Pacific, and Puerto Mexico, formerly called Coatzacoalcos, where the great port works are nearly completed and ships drawing 30 feet of water may enter freely.

The 16,200 miles separating Liverpool from Auckland, in New Zealand, have been reduced by the Suez Canal to 14,600 miles, still further reduced by the Panama Railway to 13,200 miles, and to 12,800 by the Railway of Tehuantepec.

The Mexican government has left nothing undone to supply the terminal ports of this route with all possible means for facilitating rapid transit for both passengers and freight. The great success attained has shown that the foresight upon which the action of the government was based was prudent and justifiable, and that, thanks to it, the commerce of the world receives from this interoceanic route benefits of notable utility.

You, members of the National Geographic Society, have done a good work As the efficient aids to a sound and prudent diplomacy, which strives for the maintenance of harmony among nations by the force of justice, you, I say, labor to the end that nations may better know each other, and proffer the service of science to this noble aim. This is of the greatest possible importance, because one of the grand problems of the present moment is that of conquering the prejudices that keep apart peoples of different races.

For this reason, members of the National Geographic Society, you not only deserve praise from scholars for your scientific and practical work, as shown in part by your most interesting magazine, but you should also be entitled to the gratitude of statesmen for your valuable aid in the harmonizing of international policies.



PRIMITIVE POTS FOR MAKING SUGAR IN THE INTERIOR OF COLOMBIA

THE TOASTMASTER, GEN. JOHN M. WILSON

Honors are heaped upon us tonight. We have with us that noble and distinguished statesman, that wonderful writer, that magnificent man who represents the great Kingdom of Great Britain, upon whose dominions the sun never sets; that country that has given us some of the greatest of soldiers, some of the greatest of statesmen. It gives me pleasure to present to you Ambassador James Bryce, of the great Kingdom of Great Britain.

THE BRITISH AMBASSADOR, HON. JAMES BRYCE

Mr. Chairman, Ladies and Gentlemen: I did not come here with any intention of addressing you. I knew that you had already a program which would be amply sufficient for the time, and I had really nothing to say, which, however, is the smallest reason that ever is assigned for not making a speech. But I came because it is always a pleasure to me to be in a company of geographers who represent in a very large sense the whole world, their nature being that of making the people of every part of the world know the people of every other part of the world, and thereby bringing about that good understanding which is the basis of international peace.

There is only one observation which has occurred to me as I am thus suddenly called to my feet. It is suggested by the journey from which I have just returned in the Southern Hemisphere. It has always seemed to me that the one dark cloud on the horizon of our geographers, the one drop of bitter which prevents us from enjoying the draught of knowledge which is raised to our lips by every successful geographer, is the sense that this planet of ours is limited, and that in time we shall have exhausted all its resources as far as exploration is concerned. We are accustomed to take large views of time as well as of space, and we do not want so to define and dispose of the whole earth as to leave nothing for the many generations that are to come after us—as I believe the astronomers allow us several millions of years until the changes in the solar system will bring this earth and its population to an end.

Well, I received some consolation in visiting South America from this nightmare of a sense of exhaustion which sometimes arises in the minds of geographers, because I found in traversing South America that there is still a vast deal left that the geographical explorer has to do. And I should like to call the attention of those aspiring spirits among you who wish to associate your names with further discoveries to the opportunities which that great continent offers.

Of course, these are no longer the days of the most sensational discoveries. We cannot have anything to look forward to like the discovery of the Pacific Ocean or the North Pole or the Grand Canyon of the Colorado River. But still there is a vast deal of useful geographical work to be done, particularly in the center of the South American continent. There are regions in the eastern part of Bolivia and Peru, and in the western parts of Brazil, and in the adjoining parts of Argentina, Venezuela, Colombia, and Equador, which are practically unknown, and where an immense deal is to be done, not only by the naturalist, the biologist, and botanist, but also by the simple explorer, in determining the course of rivers, the heights of mountains, and in ascertaining the resources of the country.

At present there are two forces at work in exploration; the one is that of the railway projectors, who are laying out lines, some of which will be completed and some of which will have to wait a good while for completion, and perhaps a longer time still before they afford an adequate return to shareholders. And there are also the people who are exploiting the resources of the country and who are more concerned with making profits than with scientific discovery. Now there is a great field for

the scientific explorer. There are no countries in many ways more interesting than these countries as regards the grandeur and the peculiar character of their scenery, and as regards the extraordinary spectacle presented by the unexampled and exuberant resources of nature. I do not think anything in the world is more striking than the resources of nature as in a South American forest.

Therefore I can console you by telling you that there is still a great deal remaining for geographers to do, and that there is a field open to any geographer who will devote himself to that continent. We in Great Britain have sent thither many explorers, and I hope we may send many more. You here I hope will join us in this effort. In the remoter part of these countries the idea of exploring for purely scientific purposes has hardly reached the peasantry. Everybody is supposed to be looking for mines hidden in the days of the Incas. But if you will play your cards judiciously you may for a time at least facilitate your searches.

Ladies and gentlemen, let me thank you for the opportunity of being present among you this evening. Let me tell you that in addition to the enjoyment you will have if any of you go there in adding new realms to knowledge, you will also have one of the greatest pleasures that the poetical and philosophical mind can enjoy, in contemplating these scenes of nature, which open much that is not to be paralleled elsewhere, which give one a lively sense of what that magnificent continent will become when its resources have been further developed.

THE TOASTMASTER, GEN. JOHN M. WILSON

The honor seldom comes to a soldier to present such a magnificent body as this to his Commander-in-Chief, as I propose to do in a very few minutes. We have with us the President of the United States, a man who has never failed in any duty, who has won the love and respect and admiration of the American people without regard to politics or anything else, who today stands before the world as a great and magnificent chieftain of a nation of 93 million people within its own limits, and who waves the American flag over 8 million more for their protection. It gives me pleasure to present to this Society as one of its five honorary members the President of the United States.

THE PRESIDENT OF THE UNITED STATES, HON. WM. H. TAFT

Ladies and Gentlemen of the National Geographic Society: It is always a great comfort to be at a meeting presided over by General Wilson. He conducts it as a military man. I have always thought that even the Speaker might learn something from General Wilson, and I commend him to Brother Champ Clark as to how to carry on a deliberative assembly.

I am very much honored to be made an honorary member of the Geographic Society. I do not think I deserve it, but not for that reason will I decline the honor and the membership.

One has a constant source of regret for what he loses as he sees the opportunities pass by in life. As I stand in this presence and look at Mr. Grosvenor, I am constantly reminded of the valuable information that he is giving to the public through the Geographic Magazine that I have to pass over because I do not have time to read it; and if this association is maintained for the purpose of carrying on that Magazine, I am sure it can justify its existence.

The British Ambassador has referred to a number of places to which the National Geographic Society might direct its attention. I wish to add two more. One is Sumatra and the other is the Philippines. We are doing a good deal in the Philippines in the way of attempting to develop that country, but there is a great opportunity for a scientific survey of the islands with respect to a great many data that would give us exact information that we do not now have. In the enthusiasm of a desire to do everything in the Philippines at once, I suggested and urged the passage of a bill

for the appropriation of $10,000,000 to make an investigation in those islands, and make them complete according to scientific ideas. But after I had found a great deal of difficulty in getting two or three millions out of the government for the purpose of helping us along with our education and with other things, I concluded that that sort of a survey was in the nature of a luxury and might be postponed for many years; but luxuries are to be reached through private contributions. We in this country depend on the generosity of our millionaires for doing the things that we do not think the government ought to do, and I suggest that one very useful place in which to spend the income from these $10,000,000 funds that are being distributed with such a lavish hand would be a scientific survey in the Philippines.

Another thing I should congratulate the National Geographic Society upon is that Congress is taking slow steps—but I hope sure steps—to recognize in an appropriate way the man who went to the North Pole. You who are scientific members of this body understand the value of what he did, and all of us who have read can understand the tremendous labor that he undertook and the amount of inconceivable endurance that he had in winning that place, which, when we find it, does not seem to be particularly useful except by way of satisfying what had theretofore been a most dangerous curiosity. I sincerely hope that Congress will recognize the fact that Commander Peary has done something of which every American ought to be proud, and which, if he had been an Englishman or a German or a Frenchman, would have been long ago recognized by a promotion to some permanent honor and by something more substantial that would have enabled him to enjoy that honor without working.

Now, my friends, I did not intend to make a speech any more than Ambassador Bryce; but I cannot close without making a remark or two in respect to something in which the National Geographic Society is deeply interested, because when it is completed it will change geography and it will make the Atlantic and the Pacific oceans very much the same. Ambassador Bryce visited Panama two or three weeks before I did. He sent me some suggestions with reference to the geological investigations that ought to be made there; and, having the power without consulting Congress to send a geologist there, I did so. And he discovered a condition of things on the Isthmus that will certainly be most interesting to geologists and is certainly most valuable to us in the construction of the canal with reference to the slides that may be anticipated in the deep cut at Culebra.

I am glad to be able to say that the work is going on and that quite a number of months before January, 1915, I hope, we shall have straits cutting through the Isthmus, for the canal will be 300 feet wide in the narrowest part and will in almost all its length be 500 to 1,000 feet wide. We shall have straits there that will carry out the idea that was conceived in the time of Charles V, when the Isthmus was first discovered. It has taken 400 years to carry out that idea, and it must thrill through the veins and the nerves of every American to go down there and see that work and realize what this country is doing there with the aid of its army engineers and with the organization which moves as one machine through 40 miles to cleave that isthmus and make it an instrument of commerce between the oceans. I thank you.

THE TOASTMASTER, GEN. JOHN M. WILSON

We have heard a magnificent diplomat when we have heard the Chief Executive of the United States. Now we turn to the Army of the United States. It gives me great pleasure to present to you a soldier and a scientist, a man who has given magnificent service in the Indian country, whose service in the Spanish war was great not only from a military point of view, but as an executive officer, and who afterwards did even more superb work in the Philippines. It

gives me pleasure to present to you Major General Wood.

MAJ. GEN. LEONARD WOOD, CHIEF OF STAFF, U. S. ARMY

Mr. Chairman, Mr. Toastmaster, Ladies and Gentlemen: I have had the good fortune tonight to sit beside Mr. Wright, and I have tried to pull a little information out of him about his work with the Army. But those of you who know him know that he is so modest and so reticent that to get information out of him is a good deal like mining, for you have to work it out in little pieces. He is the father of aviation in our Army. He has instructed a number of our officers in the use of the aëroplane, and he has laid the foundation for a corps of officers skilled in the use of this most useful machine. All of us soldiers look upon the aëroplane as a great addition to our warlike apparatus. We know that its use is going to be invaluable in future wars. As a means of reconnaissance, of locating the forces and dispositions of the enemy, it will be invaluable. Its use is going to be rather hazardous, and as yet I look upon it only as an instrument or means of reconnaissance and for the transportation of messages and perhaps messengers. But there is no doubt, if the rate of progress made the last year or two is continued, that we shall soon have machines working with great accuracy and great speed and carrying two or perhaps three or four people, or the equivalent amount of material, to places which would otherwise be inaccessible. I think the course of the next war, certainly the course of all the larger operations, will be very largely influenced by the knowledge that the enemy will have a machine which will enable it to fly over their lines and locate their dispositions and see where their reserves are, etc.

Now, the work that Mr. Wright has been doing has not received much encouragement from the government. While the governments of France, Germany, and other great European countries have made very large and liberal appropriations for the purpose of instructing their officers in the use of the aëroplane and providing machines for their use, we have one old machine which the chief signal officer told me the other day he thought could be put in working order for seventy-five or eighty dollars. And one of the officers volunteered to put up that amount of money and see if he could get it off the ground again. That is the condition of aëronautics in our military establishment. The officers are willing if the money is forthcoming.*

Some young men scattered throughout the country who own aëroplanes, under the leadership of Mr. Thomas Ryan, of New York, and others, have gotten up a voluntary aëronautical club, and they are working at a plan to organize a sort of aëro-militia, if I may use that term, and put themselves entirely at the disposition of the government. They have recently made application for the use of some of the government land near Washington, and propose to keep a number of machines for the purpose of instructing the officers of the Army, and all of us who are interested in this work are trying to assist them in obtaining the use of a suitable piece of public property. We feel sure that as soon as this work is taken up and the government sees the future of it, that money will be forthcoming, and the United States will be the last in the procession. I thank you very much for your kind reception.

THE TOASTMASTER, GEN. JOHN M. WILSON

Before calling upon the eminent scientist, Mr. Wright, Major General Greely, a distinguished scientist, has a few words to tell us about the experiments of Secretary Langley in aëronautics before his death. I present to you General Greely.

MAJOR GENERAL A. W. GREELY

Mr. Chairman, Mr. Toastmaster, Ladies and Gentlemen: The dinner tonight is in honor of the Army, which gave the

* The Congress has since made an appropriation of $125,000 for the purchase and operation of aëroplanes.

first victim to modern aviation through the death of Lieutenant Selfridge, of the Signal Corps. As I would not have you think that the Army is entirely unmindful of what it owes to the civilians of the country, I wish to say a few words in memory of the father of modern aviation, the late Samuel Pierpont Langley.

When the Board of Ordnance and Fortification of the Army allotted fifty thousand dollars for the purpose of constructing a full-sized aërodrome I was the officer associated with Mr. Langley by being designated as a legal supervisor of the expenditures for that purpose. The history of that work is known. A machine was built. It was ready for testing, but in launching, through accident, it was so injured as to make it impossible to fly, although today it is recognized that the aërodrome was constructed suitably for aviation. As a result there came an abuse and revilement which hastened Professor Langley's death, causing in him a sense of humiliation at the loss of his reputation and at the unfortunate results. People said that he was a dreamer and not a worker. Dreams pass, but work abides, and on the foundation which Langley so well builded has grown up this wonderful fabric of modern aviation.

And I would like to tell you that Professor Langley foresaw this shame and humiliation and possible failure. When I informed him that the money had been allotted and asked him when he would go to work, he took me in his confidence and told me what he thought and what he foresaw. He believed aviation practicable and possible, but he said, "You see what I risk for this work." And, after a week of mature reflection, he took upon himself this great and, as many thought, impossible task. He gave to it the best of his scientific ability. He risked the loss of his reputation. He faced unflinchingly the criticisms and reflections that were made upon him, and, unfortunately, he died before he saw the full measure of success which came from his self-sacrificing work.

I have had fifty years of public service, extending into different spheres and varied in its activities, and I have been familiar with many forms of altruism, but in them all I have never known a loftier note than was sounded by this man when he risked everything that was dear to him, things which he valued more than life, for advancing the interests of humanity, for enabling man to dominate the unknown kingdom of the air. And so tonight I felt that I should like to say a word for this man who dared and who suffered in the interests of science and of the world. Samuel Pierpont Langley was our associate. Now he is our fitting exemplar.

THE TOASTMASTER, GEN. JOHN M. WILSON

The closing address will be made by the distinguished aviator, Mr. Wilbur Wright, and after he finishes I have one word more that I will add, and then we will close the evening's entertainment. Mr. Wright is believed to be the first successful man in the use of the aëroplane. He has received the medal of Congress and he has received the Langley medal. His career is well known to all, and he stands before you tonight with that clean-cut, pleasing face to tell us what he has done and what he will yet accomplish.

Sixty years ago, as a boy of 13 I attended the old National Theater here and saw a play called "Washington a Hundred Years Hence." There were scenes of excursions to London, going over in the morning and returning in the afternoon; also excursions to Mars. I am sure I do not know whether Mr. Wright is going to carry us that far. But he will give us an interesting talk, I am sure. I present to you Mr. Wilbur Wright.

MR. WILBUR WRIGHT

Mr. Chairman, Ladies and Gentlemen: When the Director of your Society extended me the invitation to be present at this dinner he indicated that a few remarks might be required from me. This

game of after-dinner speaking is one that I have never played very much; so I said to myself, "It will be a good thing to study up on the rules of the game."

So last week I went up to New York and had an opportunity to attend a dinner there at which were present a number of distinguished speakers. The first gentleman on the program was a bishop, and he made a splendid speech. I said to myself, "If it is necessary for me to speak like that I might as well give up trying to play this game." But as the evening wore on I began to discover things. I found out after a little bit that this man had been stealing the speeches of all the men who were to follow him on the program; and not only that, but, according to the statements of the other speakers, he had not only stolen their ideas, but he expressed them better than they could express them themselves. "Well," said I, "if a man is permitted to steal the speeches of all the other men on the program, it is an easy job." So when I heard that among the speakers this evening were some of our most distinguished men, including the President of the United States, I said to myself, "This will be an easy job. I will steal their speeches and I will present them better than they could present them themselves."

But unfortunately the novice often learns some other rule that is equally as important. In this case the rule I overlooked was the rule that provides an arrangement of the speakers on the program. Instead of being on first, so that I could steal their speeches, I have been put on last, with the result that all the speech I was going to make they have made; and, as usual in banquets, according to rule, they have said it a great deal better than I could say it myself.

But I have discovered one other rule that is customary in this game, and that is to choose the subject which is appropriate to the occasion; and another rule: confine your remarks strictly to the subject. Therefore I chose for my subject this evening "geography." I shall confine my remarks more particularly to that branch of geography which I discovered on the front of a book once in my father's library. The book was entitled "The Geography of the Heavens." I am not certain now whether the book treated of astronomy or whether it was a book on theology. For my part I steered clear both of astronomy and theology; and, in order to keep off the ground that might have been covered in that book, it is my intention to turn the subject exactly upside down, and instead of viewing it from the ground I will view geography from the heavens.

The ways and means of studying the earth from above have now become pretty well known. Some of the uses which may be expected to be derived from the aëroplane and similar instruments have been told you very well by our distinguished friend, General Wood. The real uses of the aëroplane in warfare are so much better known to him and have been so much better presented that I shall not attempt to take up your time with that. The advantages of knowing what the enemy is doing, with the consequent advantage of being able to concentrate your own troops at the critical spot—the advantage of rising high in the air for the purpose of determining the accuracy of gun-power and giving appropriate directions for carrying on work of that kind—are so well known that it is useless for me to take it up now.

The leading nations of the earth are taking up the subject, our own nation being the first of all to begin it. But, unfortunately, there seems to be some hesitation at present. I do not know exactly what the trouble is. I presume possibly that if we were to apply the parable of the talents we would possibly arrive at something near the present situation. The Department probably feels that with the small equipment it now has it is useless to do anything. On the other hand, Congress seems to feel that unless something is done with the equipment already on hand it is useless to appropri-

ate for it now. I hope the day will soon come when more will be done with what we already have, so that Congress will see fit to appropriate more if it sees that the money will be well spent. I thank you very much.

THE TOASTMASTER, GEN. JOHN M. WILSON

Thanking you for your presence with us tonight, I must, before closing the pleasures of the evening, give to you "a wish for you all," which a charming Southern gentleman gave to me a few years ago when with a delightful party we were sailing on one of Maine's most beautiful lakes:

"Sweet as the song which the robins sing,
Pure as the flow of a crystal spring;
Deep as the depths of a mother's love,
True as your faith in the God above;
With a harvest of smiles and a famine of tears,
Through all the course of the coming years,
So sweet, so pure, so deep, so true,
Be the joys fate holds in store for you."

MEMBERS AND GUESTS PRESENT

The committee in charge of the banquet consisted of: Gilbert H. Grosvenor, Chairman; John Oliver La Gorce, F. B. Eichelberger, O. P. Austin, Charles J. Bell, John Joy Edson, David Fairchild, C. Hart Merriam, Henry F. Blount, C. M. Chester, Frederick V. Coville, John E. Pillsbury, Rudolph Kauffmann, T. L. MacDonald, S. N. D. North, Alexander Graham Bell, Henry Gannett, John M. Wilson, J. Howard Gore, A. W. Greely, Willis L. Moore, George Otis Smith, and O. H. Tittmann.

The members and guests present were as follows:

Brigadier General James Allen, Chief Signal Officer, U. S. Army.
Representative and Mrs. Wyatt Aiken, of South Carolina.
Mr. Charles Francis Adams.
Miss Rebecca Adams.
Mr. and Mrs. Geo. C. Altemus.
Major Henry T. Allen, U. S. Army.
Representative and Mrs. D. R. Anthony, Jr., of Kansas.
Mr. J. A. Aspinwall.
Mr. J. C. Aspinwall.
Hon. O. P. Austin, Chief of U. S. Bureau of Statistics and Secretary of the National Geographic Society, and Mrs. Austin.
Representative and Mrs. D. S. Alexander, of New York.
Hon. John Barrett, Director of the Pan-American Union.
Mr. Charles J. Bell, President American Security and Trust Company.
Miss Aileen A. Bell.
Mrs. I. P. Berthrong.
Honorable and Mrs. A. B. Browne.
Senator A. O. Bacon, of Georgia.
Mr. and Mrs. Ira Bennett.
Representative and Mrs. Wm. S. Bennet, of New York.
Mr. and Mrs. Scott Bone.
Mr. and Mrs. W. E. Brigham.
Senator and Mrs. E. J. Burkett, of Nebraska.
Mr. A. B. Bowers.
Dr. and Mrs. Samuel Nelson Barker.
Mr. Henry Bradley.
Mrs. Horace Bentley.
Representative Richard Bartholdt, of Missouri.
Mr. Elbert S. Barlow.
Senator Theodore E. Burton, of Ohio.
Rear Admiral and Mrs. G. W. Baird, U. S. Navy.
Miss Bertha Boody.
Mr. C. E. Borden.
Mr. and Mrs. Claude M. Bennett.
Rev. J. L. Barnhart.
Mr. Herr H. Bruning.
Mrs. Marguerite M. Brown.
Mr. Wm. J. Brown.
Dr. J. Wesley Bovee.
Mr. Ward T. Bower.
Mr. Robert Brott.
Representative W. G. Brantley, of Georgia.
Mr. Adolph L. Bernheimer.
Mr. Oscar M. Brown.
Dr. Pierre Bouery.
Senor Barranco, Cuban Vice Consul.
Colonel and Mrs. Henry F. Blount.
Senator and Mrs. Henry E. Burnham, of New Hampshire.
Senor Don Francisco Leon de la Barra, The Ambassador of Mexico.
Representative Albert S. Burleson, of Texas.
Count J. H. von Bernstorff, The Ambassador of Germany.
Mr. R. de Lima e Silva, Charge d' Affaires of Brazil, and Madame de Lima.
Dr. Francisco Carrera Justiz, The Cuban Minister.
Senor Don J. B. Calvo, The Minister from Costa Rica.
Dr. Frederick V. Coville.
Representative and Mrs. P. P. Campbell, of Kansas.
Major General and Mrs. Wm. H. Carter, U. S. Army.
The Chinese Minister and Madame Chang.
Representative and Mrs. Champ Clark, of Missouri.
Captain Y. O. Cress, U. S. Army.
Mr. Benjamin Carter.
Mr. and Mrs. Melville Church.
Colonel E. H. Crowder, U. S. Army.

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Mr. and Mrs. J. D. Carmody.
Brigadier General J. J. O'Connell, U. S. Army.
Mr. Harry Caplin.
Mr. and Mrs. Ernest J. Clark.
Mr. Edward S. Curtis.
Mr. and Mrs. William C. Church.
Mr. and Mrs. Frank G. Carpenter.
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Mr. and Mrs. A. J. Corning.
Mr. and Mrs. William E. Curtis.
Mr. and Mrs. E. B. Clark.
Mr. Reuben Clark.
Major Chas. H. Cole, U. S. Army.
Representative and Mrs. Henry Allen Cooper, of Wisconsin.
Mr. Howard Crawley.
Representative R. H. Cameron, of Arizona.
Miss Marian Cock.
Dr. and Mrs. N. A. Cobb.
Mr. Walter I. Dawkins.
Major Jas. T. Dean, U. S. Army.
Mr. B. M. Des Jardine.
Mrs. Jessie J. Dorphley.
Mr. and Mrs. Geo. R. Dilkes.
Rear Admiral and Mrs. Andrew Dunlap, U. S. Navy.
Representative and Mrs. J. W. Dwight, of New York.
Lieut. Colonel Geo. M. Dunn, U. S. Army.
Mr. William J. Duncan.
Mr. Edwin Willard Deeming.
Dr. W. B. De Garmo.
Mr. and Mrs. Robert M. Dickinson.
Brigadier General C. R. Edwards, Chief Bureau of Insular Affairs, U. S. Army.
Miss Annie H. Eastman.
Mr. Frederick Eichelberger.
Mr. Frederick A. Emery.
Mr. John Joy Edson, President Washington Loan and Trust Company, and Mrs. Edson.
Dr. Thomas E. Eldridge.
Miss Lena Evans.
Mr. David Fairchild, in Charge of Agricultural Explorations, Department of Agriculture, and Mrs. Fairchild.
Professor Hans Froelicher.
Mr. F. A. Furst.
Mr. J. Esdill Florance.
Mr. Geo. S. Fowler.
Mr. and Mrs. Herbert C. Felton.
Mr. and Mrs. Horace Fulton.
Mr. and Mrs. H. M. Fulton.
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Miss Louise Fletcher.
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Representative and Mrs. Geo. Edmund Foss, of Illinois.
Mr. Wm. J. Flathers.
Mr. and Mrs. C. J. Faulkner.
Mr. Henry Gannett, President National Geographic Society, and Mrs. Gannett.
Rev. and Mrs. Frank Goodwin.
Brigadier General J. Campbell Gilmore, U. S. Army.
Mr. Frank Gilmore.
Mr. John Gell.
Mr. Henry May Gittings.
Mr. H. E. Gerhard.
Professor and Mrs. J. Howard Gore.
Brigadier General Green C. Goodloe, U. S. Army.
Mr. and Mrs. John Gavit.
Senator and Mrs. R. J. Gamble, of South Dakota.
Mr. Wm. W. Goodale.
Mr. Edwin P. Grosvenor.
Mr. Gilbert H. Grosvenor, Director and Editor National Geographic Society, and Mrs. Grosvenor.
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Mr. Robert Gibson.
Representative J. J. Gardner, of New Jersey.
Mr. Earl L. Gregg.
Rt. Rev. Alfred T. Harding, Bishop of Washington.
Mr. and Mrs. Jacob Hasslacher.
Miss Hasslacher.
Mrs. A. C. Hensley.
Mr. James H. Hensley.
Rev. Jos. Himmel, President Georgetown College.
Rev. J. S. B. Hodges.
Mr. J. R. Hildebrand.
Mr. Samuel D. Hecht.
Brigadier General Walter Howe, U. S. Army.
Lieutenant Alfred G. Howe, U. S. Navy.
Dr. J. F. Herbert.
Dr. Guy L. Hunner.
Rear Admiral and Mrs. John M. Hawley, U. S. Navy.
Mr. Morris Harrison.
Mr. and Mrs. Geo. W. Hutchison.
Justice A. B. Hagner.
Mr. and Mrs. Christian Heurich.
Captain M. E. Hanna, U. S. Army.
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Representative and Mrs. E. J. Hill, of Connecticut.
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Mrs. B. R. Howard.
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Mr. Jay V. Hare.
Mr. and Mrs. A. Hatfield, Jr.
Mr. John W. Hamilton.
Mr. Wm. B. Hadley.
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Miss Anne C. Holden.
Rear Admiral and Mrs. Richard Inch, U. S. Navy.
Mr. W. O. Ison.
Mr. Mitchell Innes, Counselor of the British Embassy.
Mrs. C. G. Jarboe.
Miss May Jasper.
Dr. Brown Jarvis.
Mr. B. F. Johnson.
Mr. Frank Edward Johnson, of Connecticut.

Mr. H. M. Jordan.
Mr. and Mrs. Geo. H. Judd.
Mr. and Mrs. James Judge.
Dr. and Mrs. Jellife.
Representative and Mrs. J. R. Knowland, of California.
Dr. W. J. Kerby.
Representative Julius Kahn, of California.
Mr. W. F. Kinney, of Honolulu.
Dr. Geo. M. Kober.
Mr. William Kidd.
Judge and Mrs. Martin A. Knapp.
Mr. George Kennan.
Representative and Mrs. Jas. T. Lloyd, of Missouri.
Mr. Homer N. Lockwood.
Honorable and Mrs. W. H. Lynn.
Mr. and Mrs. Edw. G. Lowry.
Commissioner Franklin K. Lane, of the Interstate Commerce Commission, and Mrs. Lane.
Miss Ruth Larner.
Mr. and Mrs. John B. Larner.
Mr. and Mrs. Colin Livingston.
Representative John Lamb, of Virginia.
Mr. B. P. Lamberton.
Mr. John O. La Gorce, Assistant Editor NATIONAL GEOGRAPHIC MAGAZINE, and Mrs. La Gorce.
Mr. E. Simpson Lemmon.
Mr. John T. Loomis.
Major Gee. F. Landers, U. S. Army.
Mrs. Frank Leonard.
Mr. David Lawrence.
Mr. Wm. B. Levy.
Mr. William Law.
Mr. A. Lisner.
Miss Christine Marburg.
Mrs. Emma Marburg.
Mr. Theodore Marburg, of Baltimore.
Hon. Lee McClung, Treasurer of the United States.
Dr. Willis L. Moore, Chief U. S. Weather Bureau, and Mrs. Moore.
Lieutenant General Nelson A. Miles, U. S. Army.
Brigadier General Arthur Murray, Chief Coast Artillery, U. S. Army, and Mrs. Murray.
Representative and Mrs. James R. Mann, of Illinois.
Mr. John W. Mitchell.
Mr. John H. Mills.
Mr. Wilder Metcalf.
Mr. F. L. Middleton.
Mr. J. A. McElner.
Captain John D. Matson, U. S. Army.
Brigadier General Anson Mills, U. S. Army.
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Mr. Walter Moore.
Mr. L. H. Mattingly.
Mr. E. R. Martin.
Dr. S. B. Muncaster.
Colonel John McElroy, U. S. Army.
Mr. and Mrs. Elwood P. Morey.
Mr. Wm. F. Mattingly.
Mr. and Mrs. W. H. Moses.
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Mrs. Walter McLean.
Mrs. H. E. Monroe.
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Mrs. F. W. Mitchell.
Mr. Marshall H. Mallory.
Dr. William S. Myers.
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Dr. James G. McKay.
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Mr. C. L. Marlatt.
Commodore and Mrs. Wm. D. Moore, U. S. Navy.
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Mrs. Julia Mattis.
Miss Ida Mattis.
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Senator and Mrs. Knute Nelson, of Minnesota.
Miss Ruth Noyes.
Mr. Theodore Noyes, Editor of *The Evening Star*, and Mrs. Noyes.
Mrs. A. S. Neilson.
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Hon. D. C. Owen.
Rear Admiral Chas. O'Neil, U. S. Navy.
Hon. Robert Shaw Oliver, Assistant Secretary of War.
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Mr. Henry S. Pancoast.
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Miss Elizabeth D. Putnam.
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Representative Frank Plumley, of Vermont.
Lord Eustace Percy, British Embassy.
Baron and Baroness Preuschen, of the Austro-Hungarian Embassy.
Mr. James H. Penniman.
Mr. Arthur Plant.
Miss Pinkerton.
Mrs. M. C. Peabody.
Mrs. Florence M. Pease.
Paymaster Frank G. Pyne.
Captain and Mrs. Robert E. Peary, U. S. Navy.
Miss Peary.
Mr. W. B. Peck.
Mr. Gilbert Perkins.
Dr. E. H. Pirkner.
Mr. and Mrs. S. J. Prescott.
Mr. and Mrs. C. F. Quincy.
Mr. Lamar C. Quintero.
Representative and Mrs. E. W. Roberts, of Massachusetts.

Miss Janet E. Richards.
Mr. D. M. Riordan.
Mr. S. S. Rosenstamm.
Captain Worth G. Ross, Chief Revenue Cutter Service, and Mrs. Ross.
Mr. F. A. Richardson.
Mr. Blanchard Randall.
Mr. and Mrs. E. Kelly Rothstein.
Mr. W. P. Ryan.
Mr. and Mrs. J. B. Rumbough.
Miss Louise Randolph.
Mr. Armor Reeside.
Senor Don Juan Riano, The Spanish Minister, and Madame Riano.
Representative and Mrs. Jas. E. Ransdell, of Louisiana.
Mrs. Samuel Reber.
Senor Don Luis Ricoy, First Secretary Mexican Embassy.
Dr. and Mrs. Arthur Ramsay.
Mrs. Elsie McElroy Slater.
Mr. Geo. E. Savory.
Mrs. Edith Spoffard.
Mrs. Thomas W. Smith.
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Representative W. H. Stafford, of Wisconsin.
Representative and Mrs. Wm. Paine Sheffield, of Rhode Island.
Representative Samuel W. Smith, of Michigan.
Representative C. Bascom Slemp, of Virginia.
Mr. Orville Stewart.
Mr. Geo. W. Smith.
Mr. Milton W. Stein.
Senator and Mrs. Reed Smoot, of Utah.
Dr. Geo. H. Simmerman.
Mr. Frederick A. Stokes.
Dr. and Mrs. John Crayke Simpson.
Representative and Mrs. H. Steenerson, of Minnesota.
Representative and Mrs. John H. Small, of North Carolina.
Honorable and Mrs. George Shiras, 3d.
Dr. Hugh M. Smith, Deputy Commissioner of Fisheries.
Mr. and Mrs. Henry C. Stuart.
Representative and Mrs. Chas. F. Scott, of Kansas.
Mr. W. A. Slater.
Mrs. H. T. Sharp.
Senator F. M. Simmons, of North Carolina.
Major George O. Squier, U. S. Army.
Mrs. Matthew T. Scott, President Daughters of American Revolution.
Colonel A. C. Stedman, U. S. Army.
Mr. and Mrs. Geo. Williamson Smith.
Miss E. C. Spindle.
Mrs. M. L. Spindle.
Dr. and Mrs. Isaac S. Stone.
Mr. E. H. Snyder.
Mr. and Mrs. H. W. Taylor.
Mr. W. B. Thompson.
Senator J. R. Thornton, of Louisiana.
Hon. O. H. Tittmann, Superintendent U. S. Coast and Geodetic Survey, and Vice-President National Geographic Society, and Mrs. Tittmann.
Youssouf Sia Pacha, The Turkish Ambassador.
Mrs. Rosa Townsend.
Rev. and Mrs. John Van Shaick.
Representative and Mrs. E. B. Vreeland, of New York.
Captain S. P. Vestal, U. S. Army.
Dr. and Mrs. Geo. Wood.
Mr. E. O. Whitford.
Miss N. L. White.
Mr. and Mrs. B. H. Warner.
Mr. S. W. Woodward.
Miss Woodward.
Mr. and Mrs. M. I. Weller.
Mr. Richard B. Watrous.
Dr. J. H. White, U. S. Marine Hospital Service.
Surgeon General Walter Wyman, Public Health and Marine Hospital Service.
Mrs. E. R. Waters.
Mr. and Mrs. Ernest G. Walker.
Mr. Gardner F. Williams.
Mr. Theodore Weed.
Mrs. Harriet Wood.
Colonel and Mrs. M. A. Winter.
Representative Wm. H. Wilder, of Massachusetts.
Mr. Franz Workman.
Mr. Lee M. Welbourn.
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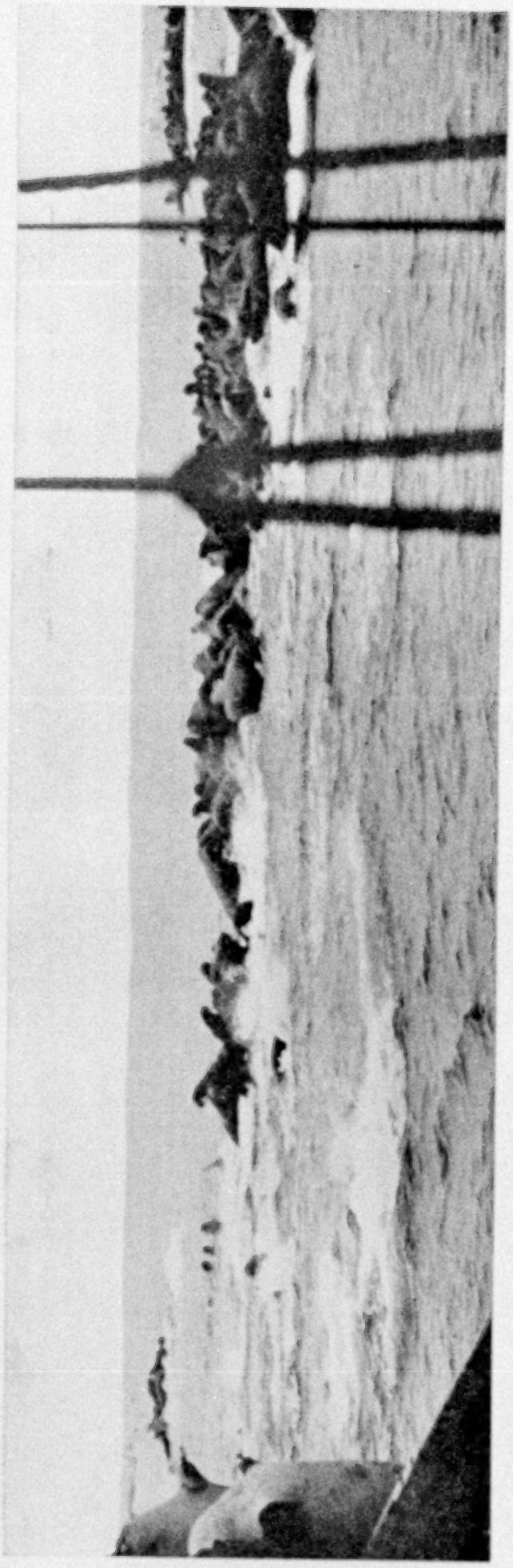
Captain E. Wittenmyer, U. S. Army.
Dr. James M. Wilson.
Mr. C. L. Welch.
Mr. Frank Whitehead.
Mr. John G. Worth.
Mr. and Mrs. F. D. Waterman.
Representative Wm. H. Wiley, of New Jersey.
Brigadier General and Mrs. Chas. H. Whipple, U. S. Army.
Brigadier General John M. Wilson, U. S. Army.
Hon. Dean C. Worcester, Member Philippine Commission.
Major General Leonard Wood, Chief of Staff, U. S. Army, and Mrs. Wood.
Mr. Wilbur Wright.
Brigadier General W. W. Wotherspoon, U. S. Army, President Army War College, and Mrs. Wotherspoon.
Hon. Chas. D. Walcott, Secretary Smithsonian Institution, and Mrs. Walcott.
Mr. Francisco J. Yanes, Secretary of Pan-American Union.
Representative and Mrs. H. O. Young, of Michigan.
Mr. R. A. Young.

HUNTING WALRUS IN BERING SEA

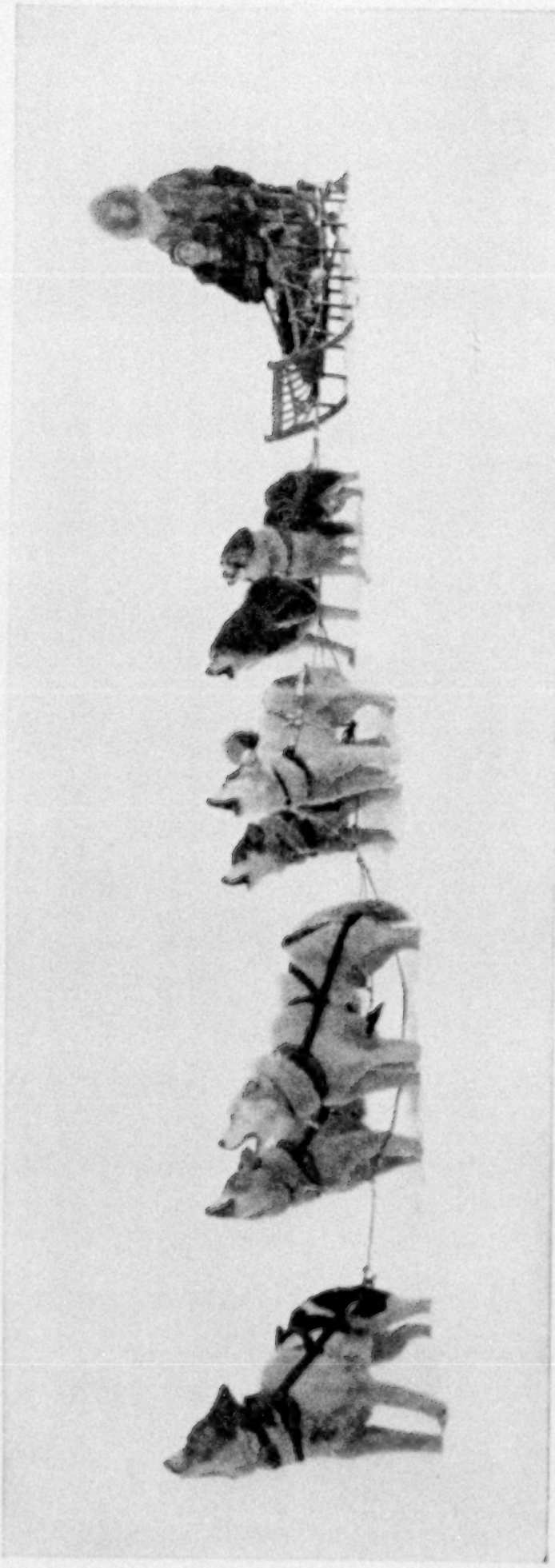
Hauling aboard an immense polar bear, which had been shot many miles from land. The polar bear thinks nothing of traveling hundreds of miles on an ice floe, feeding principally on seals. It is also very fond of walrus meat, and preys frequently on its clumsy neighbor.

The lower picture shows a number of walrus asleep on the ice-floe (see page 286).

XUM

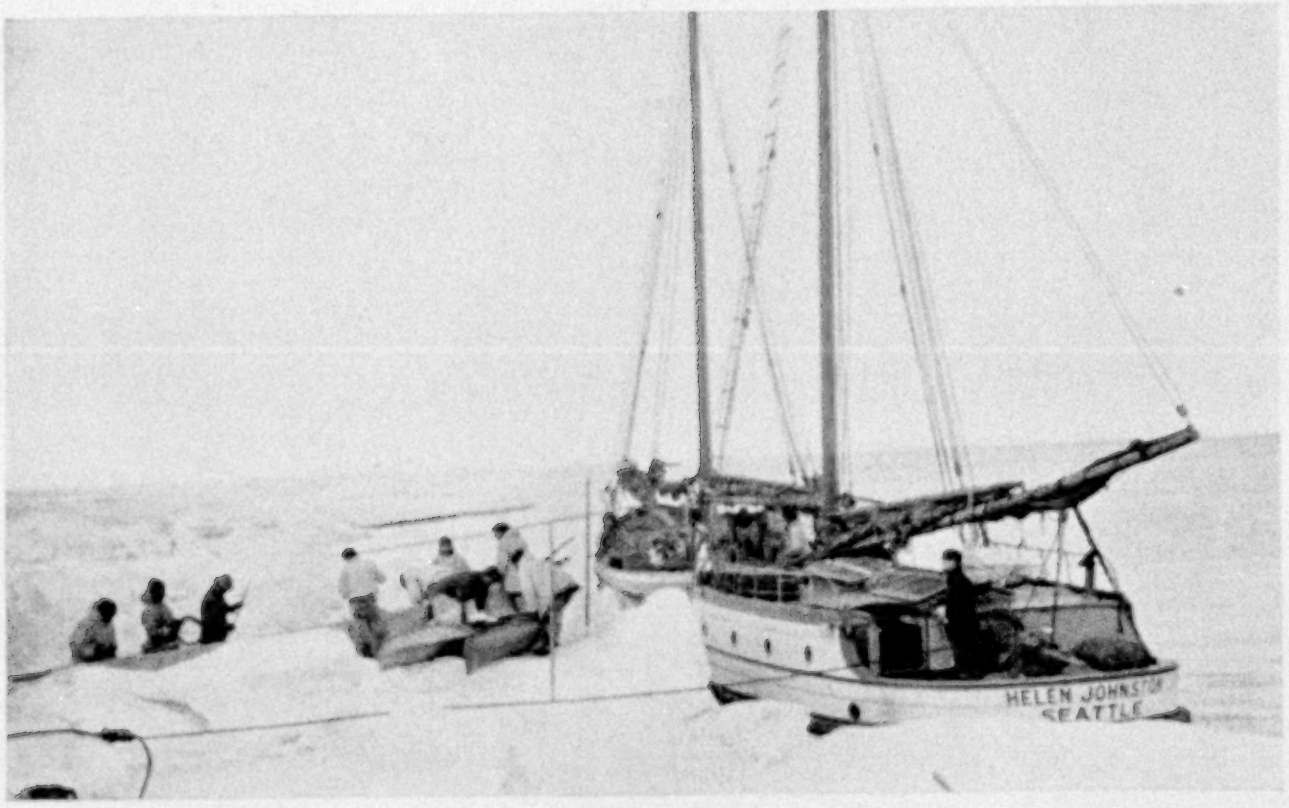


SAILING BY VAST HERDS OF WALRUS IN BERING STRAIT IN THE SUMMER OF 1910



THE MALAMUTE CHORUS: NOME, ALASKA

Photos by Dobbs, of Nome, Alaska



HUNTING WALRUS IN BERING SEA

The upper picture shows the walrus hunters disembarking their boats and skin kayaks. The ship remains moored to the ice floe while the men hunt the walrus from the ice or from the boats.

Walrus that have been killed and are "buoyed" on the ice until the hunters can cut off the tusks. Many, however, of these magnificent animals when shot plunge into the ocean, where they sink before they can be secured.

FIFTY UNUSUALLY MAGNIFICENT WALRUS HEADS Photo by Dobbs, of Nome, Alaska

From this and the next pictures the reader will readily infer that the Pacific walrus is being very rapidly exterminated. The survivors are being driven further north each year. Such numbers of the animal as shown in these pictures had not been seen for some years, and similar herds will probably never be seen again. Fifteen years ago the number of walrus tusks from Alaska sold in San Francisco amounted to over 10,000. Now the sales are less than 100 per year. Government regulations for the protection of the walrus in Alaskan waters, promulgated in 1910, prescribe an open season for walrus hunting north of the Kuskokwim River from May 1 to July 1, and forbid all killing in Bering Sea south of that river and in Bristol Bay until 1912.

UMX

Photos by Dobbs, of Nome, Alaska

CHOPPING OFF THE WALRUS TUSKS, THE ONLY PART OF THE ANIMAL THAT IS UTILIZED BY THESE HUNTERS

The tusks are solid ivory, hard and more yellowish than those of elephants. Both males and females have tusks, but the females' are longer, their huge teeth sometimes reaching 30 inches in length. The animal uses the tusks to dig up clams from the sea bottom and to help it climb on to the ice. The ivory now sells for a dollar a pound in the open market at San Francisco.

PART OF ONE MORNING'S "BAG" OF WALRUS TUSKS

The celebrated English navigator, James Cook, who met vast herds of walrus in Bering Sea hundreds of miles south of their present limit, wrote of them as follows: "They lie in herds of many hundreds on the ice, huddling over one another like swine. (They lie just like a lot of pigs in a yard.) They roar and bray so very loud that in the night, or in foggy weather, they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep, some being always on the watch. These on the approach of the boat would awaken those next to them, and the alarm being thus gradually communicated, the whole herd would awake presently. But they were seldom in a hurry to get away till after they had been once fired at; then they would tumble over one another into the sea in the utmost confusion."

The Pacific walrus is considerably larger than the walrus found on the Greenland and Ellesmere Land coasts, and whose hunting is such exciting sport. See descriptions by Peary, particularly pages 79-87, in "The North Pole." Photo by Dobbs, of Nome, Alaska.

CUERNAVACA, THE SUN CHILD OF THE SIERRAS

By Russell Hastings Millward

THROUGH the many ages of travel few spots of the world have remained unchanged in the well-trodden paths of civilization; but Cuernavaca, the Sun Child of the Sierras, lies today in the little Mexican valley of the same name well preserved in its natural beauty since the time of Cuauhnahuac, when the ancient builders wrote their history in hieroglyphics.

The name Cuernavaca, meaning "horn of the cow" in Spanish, is probably a contraction of Cuauhnahuac, the more poetic Aztec term, meaning "near the mountain," and tradition tells us that it was applied by the Spanish during the days of the Conquest, in April, 1521.

Accentuating the grandeur of the distant snow-capped mounts, Popocatepetl and Iztaccihuatl, the town is situated on the edge of the tropics, among the foothills of the Sierras. Hemmed in on every side by lofty peaks which no storm can surmount, and having an altitude of nearly 5,000 feet, which tempers the heat of a tropical sun, Cuernavaca enjoys an equable climate at all seasons of the year.

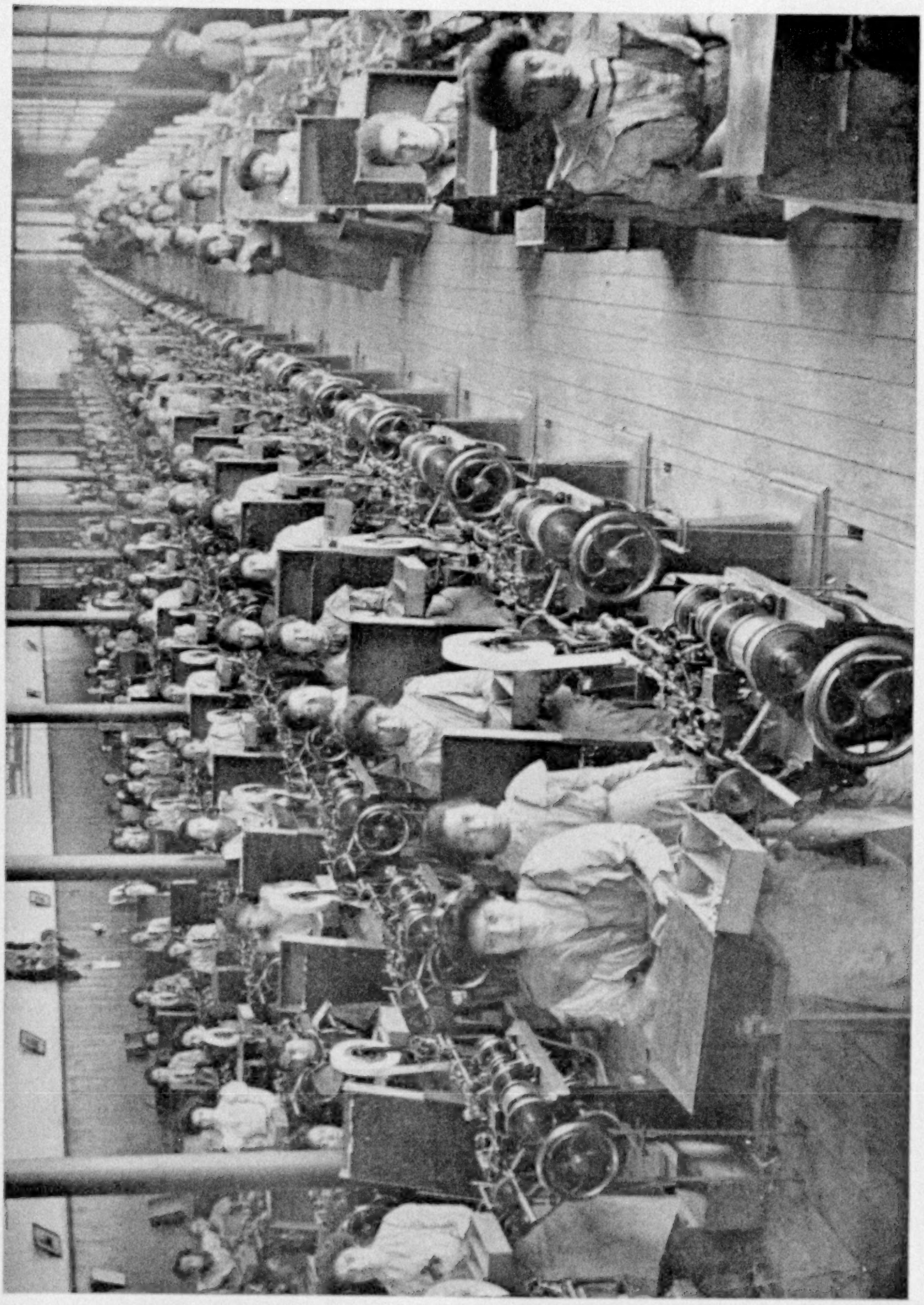
It is little wonder, then, that the Aztecs, the Montezumas, the great Conquistador, Cortez, the unfortunate Emperor Maximilian and his erstwhile Empress Carlotta sought this ideal retreat and found peace, rest, and sunshine.

There is no other 75-mile trip in the three Americas so typically Oriental and so full of charm as that from Mexico City to Cuernavaca. The four hours required to make the journey pass only too quickly, as the train winds its way through a veritable wonderland. Chapultepec, Molino del Rey, Contreras, Monte de las Cruces, and many other places of historic interest are passed, and upon reaching La Cima, the highest point on the route, at an elevation of about 10,000 feet, a magnificent view of the fertile Valley of Cuernavaca is unfolded below. Plantations of sugar-cane and coffee, fields of rice and bananas, and orchards of lemon, orange, and mango trees can be seen as far as the eye can reach.

From a line of mountains suggesting Switzerland in their sublimity and whose crests are perpetually covered with snow, the panorama extends through a country of rolling hills, winding rivers, blue lakes, tropical plains, Aztec ruins of unknown antiquity, primitive Indian villages, old mines of fabulous wealth, petrified lava streams from volcanoes of prehistoric days, and a civilization more quaint and unconventional than that found in any other part of the world.

Upon arrival at the railway station a number of rickety carriages will be found in waiting, and, after a bit of good-natured chaffing, a bargain is made with one of the "cocheros" to drive you to the village, about a mile distant. As the frail little conveyance is driven along the roadway, across the bridge, and then, swaying to and fro, over the rough cobblestones of the narrow, crooked streets of the village, you will experience a ride not soon forgotten. Vying in its excitement with a chariot race of medieval times, a contest between the cocheros is soon on in earnest. The houses of the village, which are built without a vestige of symmetry or regularity, appear to be toppling over each other as the driver frantically strives to reach the hotel ahead of his rivals. Perhaps he might be contemplating an extra tip for his cleverness, if he wins the race, for you will then be able to secure a first choice of rooms; but by what miracle has destruction of the entire outfit been averted will ever remain a mystery to you. As the fare is paid to the excited cochero you will probably declare that you will

XUM



VIEW IN A LARGE CIGARETTE FACTORY IN MEXICO CITY

Photo and Copyright by Underwood & Underwood

THE WATER CARRIER IN A MEXICAN VILLAGE

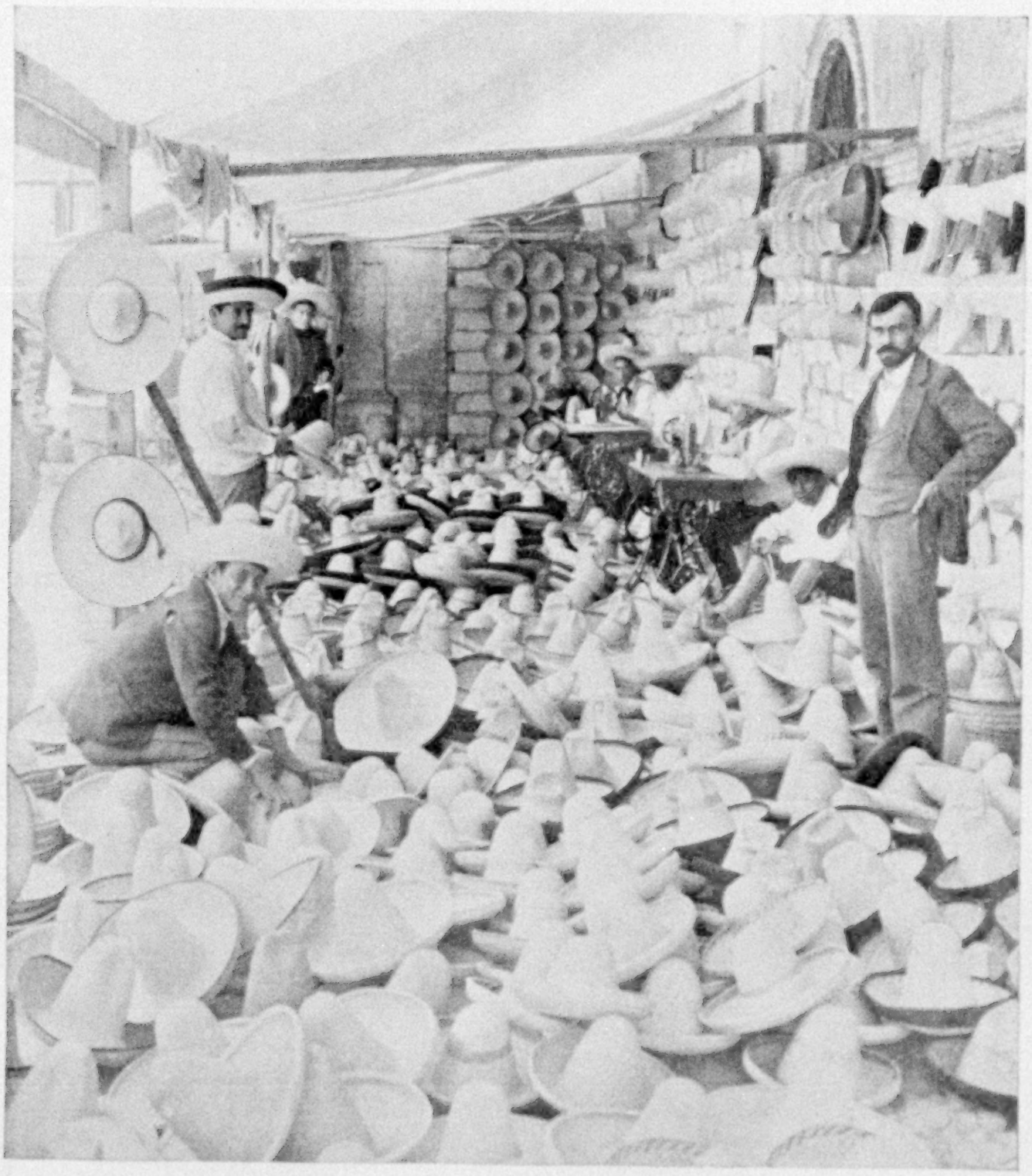
find some other means of returning to the railway station when ready to depart. The incident, however, will always prove a happy one in retrospect.

The town is located on a thickly wooded hill between two deep barrancas and surrounded by a number of precipitous gorges, which make it by nature almost inaccessible. Crossing these passes, however, are the Porfirio Diaz and several other notable bridges. From the Puente del Diablo (Bridge of the Devil) an excellent view can be had of one of the gorges and the two great springs, Ojos de Guadalupita (Eyes of the Little Guadalupe), which have been highly treasured by the natives for centuries. Quite near are numberless other springs and mountain streams, which have been united and form what is known as the municipal water-works. So great is the supply of water and so constant and thorough has been its distribution that the entire community has been converted into a rich grove of trees and innumerable gardens.

Nature has been most lavish in her gifts to Cuernavaca. Here time or money counts for little except the peace, comfort, and happiness it will bring. In no other place on earth is law more highly respected than in this curious little village of the red-tiled roofs, crooked streets, and cobbles.

A police force is almost unnecessary, as the natives are peaceful, happy, and law-abiding. The poor have practically no taxes to pay, as each year the city council calls a meeting of the more prominent property-owners, who subscribe voluntarily the sums necessary to maintain the public works and institutions. Each property-owner considers it a great honor to be one of the chosen, and cheerfully sets opposite his name such amount as his purse will allow. All funds are paid in and the necessary work done without delay. Truly, this is a model municipality.

Life is not a burden to any one in Cuernavaca. The natives converse in soft, musical tones and go quietly about



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A HAT STORE IN MEXICO

their several ways. The plazas and public markets afford agreeable meeting places and serve as an open-air social rendezvous for all classes. Military and native bands play each evening in one of the plazas, fiestas are of frequent occurrence, and the air is filled with the seductive fragrance of roses, jasmine, and orange blossoms.

Every home, however humble, has its little patio and a wealth of sunshine and flowers. The domestic life is ideal. A very pretty custom obtains on Sunday evenings and festivals, on which occasions the village maidens promenade around the plaza. They usually take the inside turn, strolling in one direction, while the "novios," or village beaux,

take the outside turn, in an opposite direction, and in this manner face each other at all times. It is not customary for a Mexican maiden to go about unless attended by some member of her family, and it is most amusing to witness the small brother, when pressed into service as an unwilling escort, trudging along hand in hand with his laughing, bright-eyed sister.

The Cortez Palace, built in 1531, where the patriot Morelos was confined as a prisoner of war, and which is now used as the capitol of the State of Morelos; and the Cathedral, built in 1535, whose tower contains a clock from the Cathedral of Segovia, bear silent testimony to the noble and quiet manner in which Hernando Cortez spent his life after the Conquest. He made Cuernavaca his residence and personally managed the vast estates in the vicinity which had been granted to him by Charles V of Spain. One of these estates, the Hacienda de Atlacomulco, is still intact and contains a sugar plantation and refinery under active operation.

During the second empire Maximilian and his consort, Carlotta, made Cuernavaca the summer capital of their court, and spent the few tranquil and happy days of a stormy career at their country residence, Olindo, in the suburbs of the town. They also paid frequent visits to the Borda gardens.

These gardens of world-wide fame were laid out by Don José de la Borda in 1762 with the idea of reproducing, on a grander scale, the gardens of Versailles. In order faithfully to carry out his plans, he sent to France for landscape gardeners and expended over a million dollars in the work. The natural springs on the estate were transformed into lakelets, cascades, and luxurious baths. Sloping terraces, bowers and trellises of roses, groves of laurel and mango, costly fountains and vases, casinos and pavilions, formed part of the adornment. Birds of gorgeous plumage made their nests and sang in the trees that shaded the fern-lined walks. Plants and flowers of the rarest varieties were brought from all parts of the world and arranged with the most artistic skill, and it has been aptly said that even today the place lacks but an apple tree to convince the visitor that it might have been the original Garden of Eden.

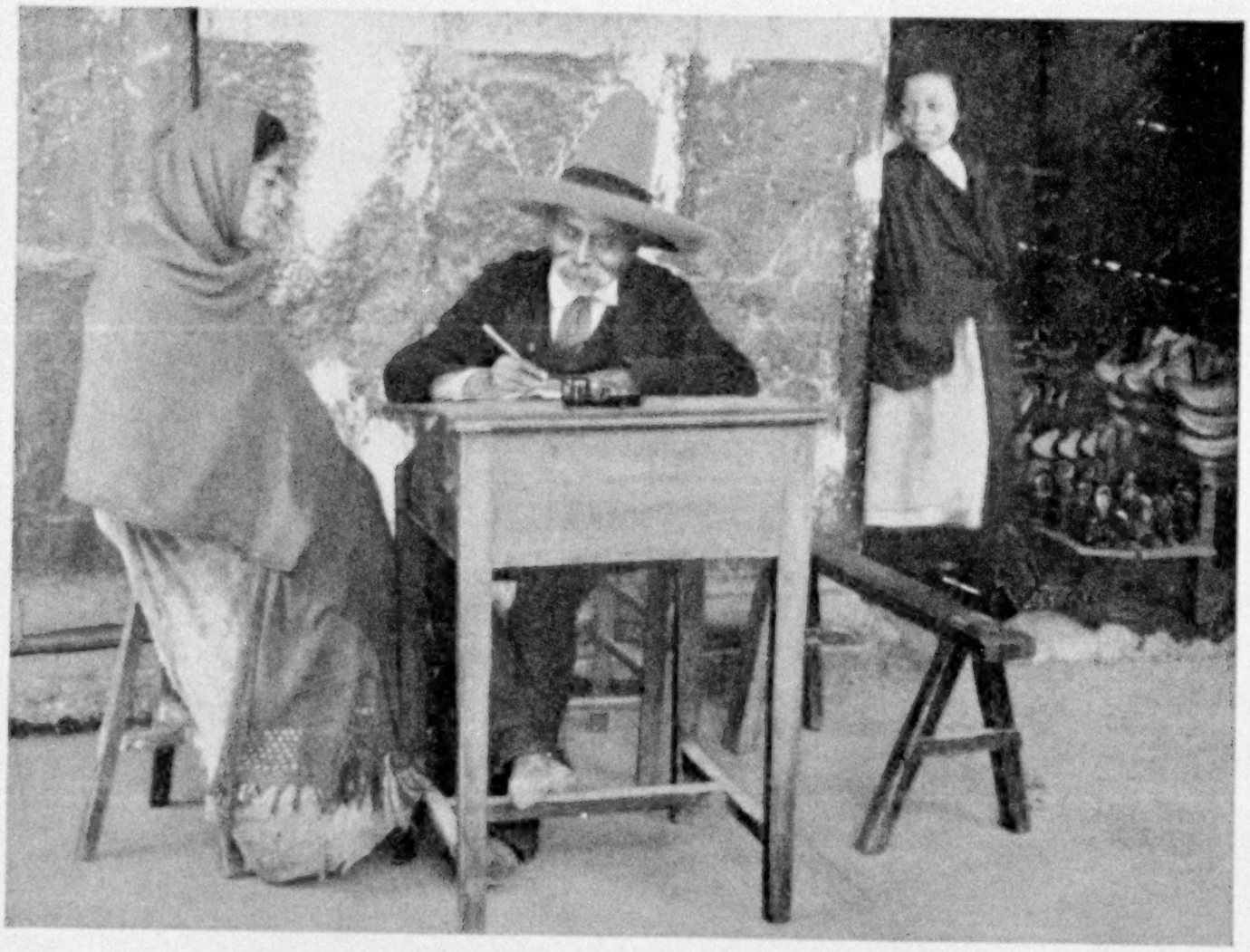
Don José was extravagant with the millions dug from his rich mines, the great "Asturiana" at Zacatecas, the Tlalpujahua, and the Tasco. During his lifetime he performed many acts of charity and gave generously to the arts and sciences. Many of his institutions have survived him, and the shrine at Tasco, which he built of virgin silver, has been classed among the most sacred of Mexico.

The Morelos baths, with their gardens of roses and tropical plants, owned by the governor of the State, remind the traveler of a bit of Granada. Then there are the gardens of the Bishop's palace, which faithfully typify a courtyard of the middle ages.

Like Boston, the streets of the town appear to have been laid out by the cows. The Calle Nacional, the principal street, with its quaint shops, offers many attractions to the lover of antiquities. There are also a number of interesting public buildings, including the palace of the governor, the Porfirio Diaz Theater—which also contains the public library—the literary institute, the post and telegraph offices, the barracks, and a number of public schools, hospitals, and charitable institutions.

It appears to matter little whether buildings are old or new in Cuernavaca. They have all taken on the mellow coloring of antiquity and harmonize with surrounding nature.

The town is unique in another respect: it is the home of Isabel Belaunsaran, maker of the smallest dolls in the world. She is called "Queen of the Needle" and is most affectionately regarded by all the natives of the village. They will tell you that no cleverer Mexican Indian maiden has ever been known, and that she has restored a certain style of needlework long supposed to have been lost. Besides the more serious work of



THE PUBLIC LETTER-WRITER IN A MEXICAN VILLAGE

Two-thirds of the 15,000,000 inhabitants of Mexico can neither read nor write

embroidering a number of costly and pretentious pieces, Isabel makes these diminutive dolls, which in both point of construction and design are the most remarkable in the world.

The operation of making consists in forming a tiny framework of wire barely three-fourths of an inch in length and winding the same with many turns of silk thread. After the frame has been properly formed it is ready for dressing. The clothing is cut according to the character of the doll and fitted carefully about the small figure. The most difficult work, that of embroidering, is then begun. With a needle that can scarcely be held in the fingers and the finest of silk threads, various designs are actually embroidered on the clothing, and so cleverly is the work executed that even through a powerful magnifying glass the details of the design appear to be perfect.

After dressing the figures it is necessary to add the hair, and what is undoubtedly an example of the tiniest and most marvelous hair-dressing known is then performed on each doll. Even to the details of the braids and ribbons, the work is completely carried out. The eyes, nose, mouth, hands, and feet are then formed and the doll is ready to be placed on sale in the village shop.

On account of their daintiness, exquisite coloring, design, and workmanship, these dolls find at all times a ready sale at the ridiculously low price of 25 cents each. But two hours are required to make each doll, so it can readily be imagined just how rapidly the work must be done, although the finished prod-

Photo and Copyright by Underwood & Underwood

GATHERING THE LUSCIOUS FRUIT OF A HEAVILY LADEN MANGO TREE: CUERNAVACA

ISABEL BELAUNSARAN

Maker of the smallest dolls in the world. She holds a tiny doll in her left hand (see page 295).

uct shows no signs other than those of artistic skill and extreme patience. By working steadily for 10 hours the sum of $1.25 may be earned—less than that paid for the same period of time to an ordinary day laborer in the United States for work of the crudest kind. So constantly has this little maiden used her eyes that she is beginning to lose her eyesight.

The dancing-girl dolls are particularly attractive. Miniature roses are embroidered on their dresses and hung about the shoulders. Ornaments are arranged in the hair and the tiny limbs are formed in graceful and lifelike attitudes of dancing.

The costume of the matador doll is gaily embroidered in colors and its hair dressed in Spanish style, including the conventional cue. Slippers are added, a sword and muleta are placed in the hands, and the manikin bull-fighter is ready to enter the ring, so far as miniature details of dress and equipment are concerned.

The flower-girl dolls are dressed according to the custom and provided with small baskets woven of fine hair filled with flowers of variegated colors. The hair is arranged in a double braid, and artistic shawls, brilliantly colored, are hung loosely about the shoulders. The tiny flower-sellers are then not unlike those seen in the flower markets throughout Mexico.

Vaqueros are represented in their most attractive and picturesque attire. Faithful reproductions of the native serapes are thrown about the shoulders, and sombreros, woven of fine hair, are placed on the heads in true Mexican fashion.

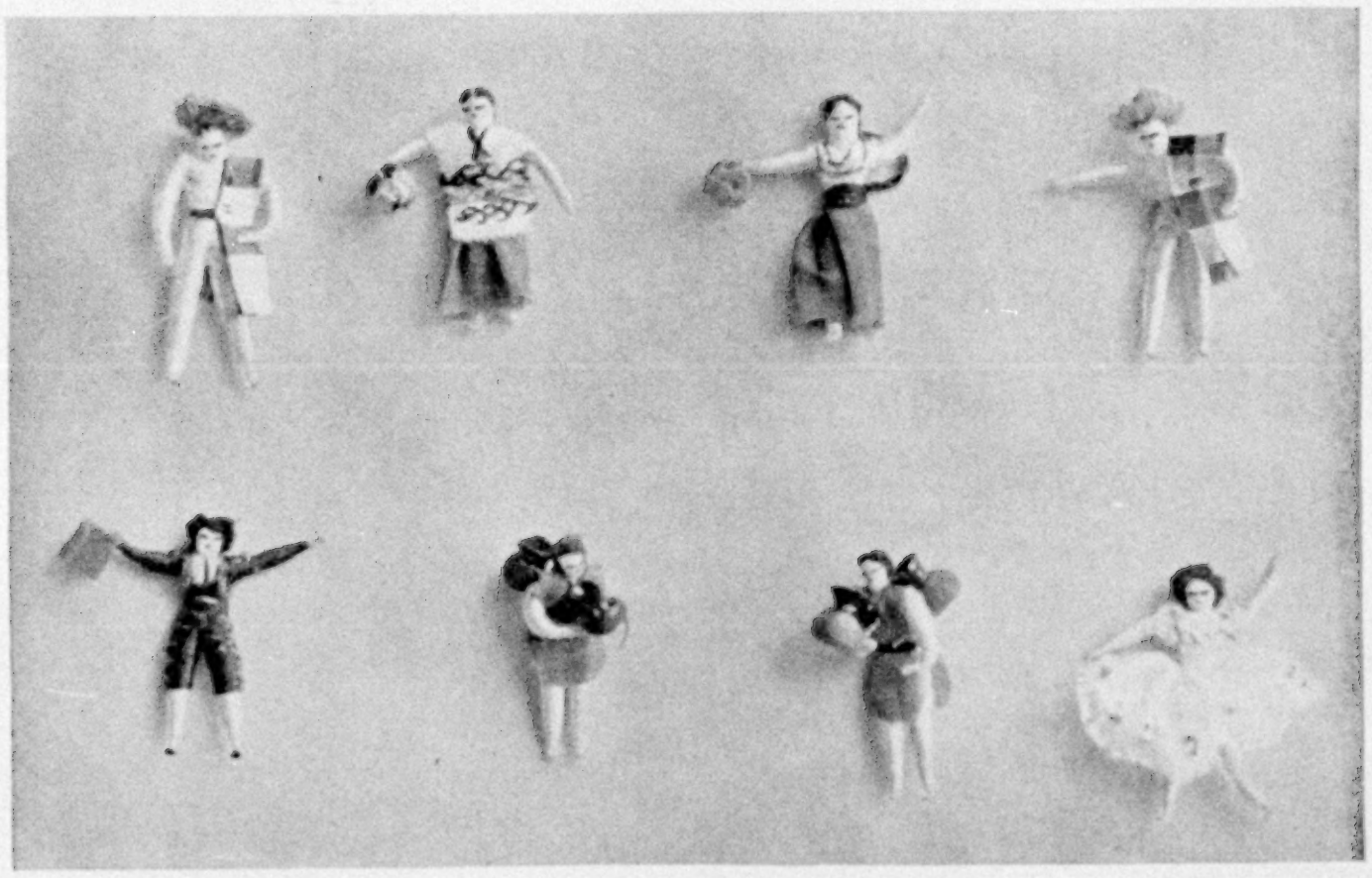
Aguadors are provided with tiny ollas, made from clay and fashioned on the exact lines and proportions of the practical sizes, and are considered important members of the doll family.

Religious dignitaries are also represented in this remarkable doll family and are dressed in full accordance with the character which they are supposed to represent in dignified miniature.

It is difficult to believe that human hands could have fashioned such wonderful little figures. A photograph cannot do justice to the coloring and execution, and it is only after they have been examined carefully through a magnifying glass that they can be fully appreciated.

The first dolls of this kind made by Isabel were secured by several of the royal families. They were also included in many private collections, where they are always greatly admired.

A German traveler criticized the dolls one day and told the little Indian maiden that in Germany they had fleas fully dressed and trained to perform the most wonderful feats. "Yes," answered she, "I remember my father telling how those trained fleas were first sent to your country from Mexico. We cannot dress the fleas so completely as the dolls, however, as we cannot make them stand still long enough. I suppose," she added, naïvely,



THE DOLLS OF CUERNAVACA, ENLARGED SLIGHTLY IN THE PICTURE
(SEE PAGES 296-298)

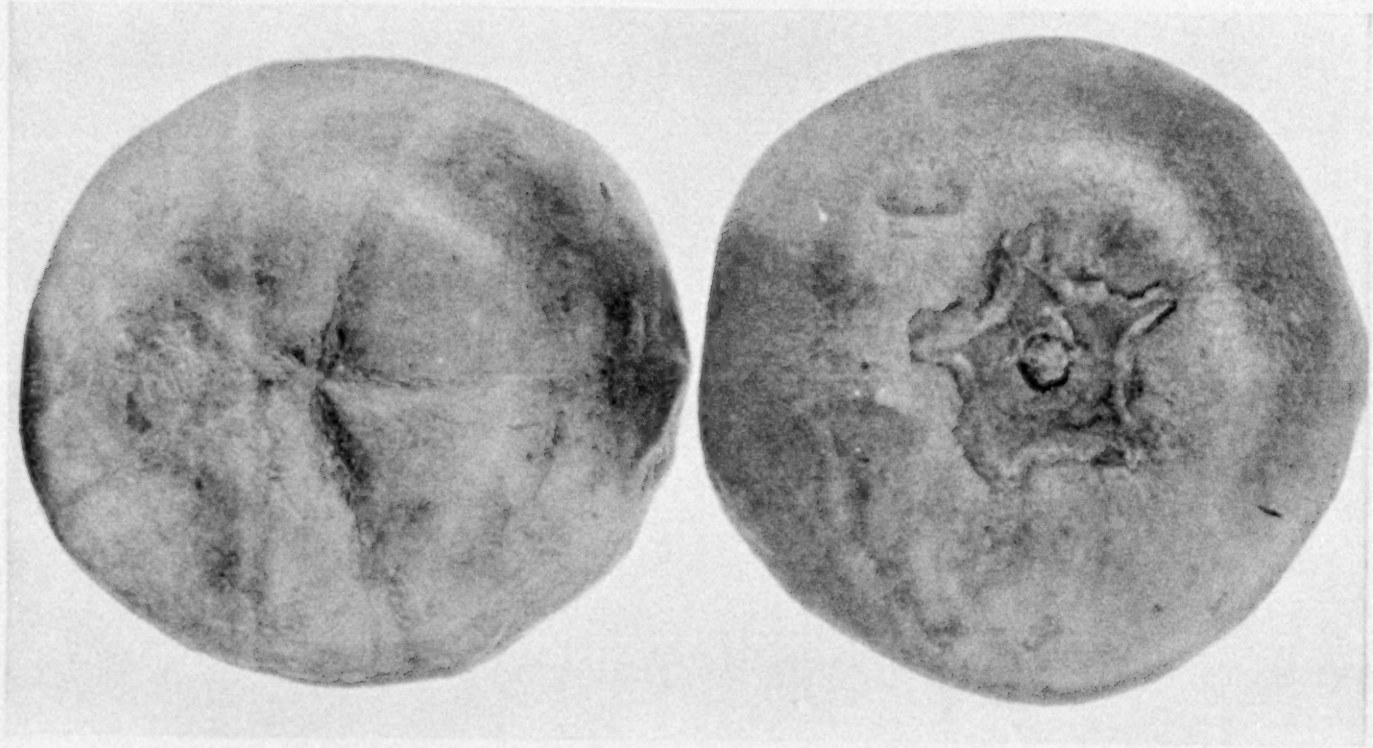
"you can make fleas stand still as long as you like in Germany."

In the vicinity of Cuernavaca the country abounds with places of geographic and scientific interest. The haciendas Acapancingo and Temisco, over two centuries old, and the Buena Vista, where sugar-cane rum is distilled, are well worth a visit. Just across the barranca to the west is a lake of great beauty and the Falls of Saint Anthony, noted for its resemblance to a long white feather. Near by is the village of San Anton, where stand several buildings of unknown antiquity and an old house built by Cortez in 1521, all in an excellent state of preservation.

Time has not been able to efface primitive methods in this locality, and Indian pottery, known as "La Verita," is still being made here by Lupe, "King of the Pottery Makers," in much the same fashion of his forefathers. This pottery is made in a great variety of distinctive shapes, is rich maroon in color, and rude, almost classic, in design.

Many prehistoric stone carvings are found in the neighborhood of Cuernavaca. The Lizard Stone, measuring nearly 9 feet in length; the Stone Eagle, measuring about 10 feet across its extended wings, and the Victory Stone, with its curious carvings of a shield, five spears, and a tomahawk, evidently marking an ancient victory, are particularly interesting.

Other evidences of an ancient civilization are found at Amanalco, Tlaltenango, Tlalmanalco, the Hill of Quauhtetl, the Ruins of Tepozteco, Xochiltepec, and in the caves of the Amates, "The Grotto of the Devil," where steps were cut from the solid rock on the occasion of a visit by Empress Carlotta. On the summit of a small ridge west of Cuernavaca are the Ruins of Xochicalo and the remains of a prehistoric city. Among these ruins is a pyramid, fort, or temple, which is built of cut porphyry and measures 68 by 75 feet. Its walls are filled with carvings of birds, animals, and warriors, which are more curious and interesting than



Photos from G. N. Collins and C. B. Doyle, Dep't of Agriculture

A POPULAR MEXICAN FRUIT, THE "SAPOTE PRIETO" (*Diosoyros ebenaster*)

It is seedless, its flesh of a very dark-brown color, and closely related to our common persimmon (see page 301)

CHILES (MEXICAN PEPPERS) READY FOR SHIPPING

anything of a similar character yet found in Egypt.

About seven miles from Cuernavaca is the Indian village of Juitepec, where some of their mysterious customs are still observed. The place has the appearance of a stage setting and the natives of the village are like the characters in a play. Each year a strange feast is celebrated in an ancient church and pilgrimages are made to its shrine by natives from a number of the outlying districts.

How these people have preserved their ancient customs through such long periods of time is unexplained. They seem to be in a world by themselves and care little about the outside. The traveler will not regret a visit to these remarkable places, which are all within such convenient distance of Cuernavaca.

Altogether Cuernavaca quite fascinates with its mysterious charm and idyllic picturesqueness. Glorying in its atmosphere of legend and romance, free from care, free from the struggles and vicissitudes of a modern world, surrounded by forbidding mountains, which seem to keep eternal vigilance over it, this little pastoral community, the Sun Child of the Sierras, peacefully slumbers and dreams on.

NOTES ON SOUTHERN MEXICO

By G. N. Collins and C. B. Doyle, of the U. S. Department of Agriculture

With Photographs by the Authors

THE chief object of our expedition to southern Mexico was to investigate the cotton culture of that region. It had been learned that there was a cotton mill at Providencia, Chiapas, and that part of the cotton used in the factory was grown locally. As the cotton-boll weevil was known to exist in this region, it became of interest to discover, if possible, why this insect did not prohibit the commercial culture of cotton here as elsewhere in the American tropics. It was further planned to cross Chiapas and visit some of the rubber plantations in Tabasco, where the oldest plantations of Central American rubber are known to exist.

During our stay in Mexico City we made a rather careful study of the markets. There was a comparatively poor display of fruits and vegetables at the time (November), much less than we saw there on our former visit. The most common fruits were bananas, oranges, pineapples, guavas, figs, pawpaws, apples, mamee sapotes, and strawberries. The strawberries were of good size and flavor and remain white when perfectly ripe.

Another fruit very common in the market at this time of the year is the "sapote prieto" (*Diospyros ebenaster*). This fruit was entirely new to us. The flesh is stringy and very dark brown, almost black. It is very unattractive in appearance and the taste is rather insipid, but the fruit is very popular with all classes, fair specimens selling at 5 cents, Mexican, apiece. Many specimens are entirely seedless, suggesting that the species has been cultivated from remote periods and probably by asexual methods. This fruit was afterwards seen growing at Cuernavaca. The trees were 40 or 50 feet high and about one foot in diameter. As this species is closely related to our common persimmon and the fine Japanese forms, it may be of interest to form hybrids of these fruits.

On December 4 we left Mexico City for south Mexico by way of Cordoba and the Vera Cruz and Pacific Railroad. Corn is quite extensively cultivated about

"DOUBLED" CORN: CHIAPAS, MEXICO (SEE PAGE 301)

Cordoba, and here, as in all parts of this country where there is insufficient pasture, the tops of the stalks are cut off for fodder as soon as the corn is full grown. At the same time the stalks are also broken down just below the lowest ear, so that the ears hang with the tips down, a process known as "doubling."

This custom of "doubling" was afterward found to be universal throughout southern Mexico, both in dry and wet regions. In dry localities it is employed to protect the grain from weevils. The corn is left in the fields often for months and, except in rare cases, is there immune from the weevils. In the moist regions this practice allows the grain to harden without injury from the rain, as the ears shed water perfectly when hanging. Doubling might be used to advantage in parts of the United States when there is excessive rain at the time of harvesting, such as the summer of 1906 in the vicinity of Washington, where quantities of corn were ruined through the germination of the grains before the corn was picked.

Another important reason for this practice in some parts of Mexico is to protect the ears from parrots and parroquites. While the ears are erect the birds can light on the side of the ear and open the husks, but when the ear is pendant they have no place to stand from which the tip of the ear can be reached.

Santa Lucrecia, which is situated at the junction of the Vera Cruz and Pacific Railroad with the Tehuantepec Railroad, is the region of greatest activity for rubber stock companies. About here and for some distance south there is little or no virgin forest, but the land is covered with a luxuriant second growth. Numerous rubber trees can be seen from the railway, but they are all small. The leaves, however, are fresh and green.

From Santa Lucrecia south the railroad gradually ascends. Before reaching the summit of the divide the country becomes broken and is covered with fine large forests. North of Rincon Antonio the land is open and rolling, cattle abound, and the dry-land type of vegetation appears.

From a botanical standpoint Rincon Antonio would be a very interesting place to spend one or two weeks. It is pleasantly situated and has what looks like a clean hotel. The climate is dry and not very hot. Trips could be made north into the fine dense forests, which are as wild and tropical as anything on the Isthmus. To the south it is but a little way to cactus forests, through exceedingly rough and interesting country. This region is sparsely inhabited and the settlement is completely isolated. A study of the agriculture of these people would probably show plants with interesting adaptations to drought and short season.

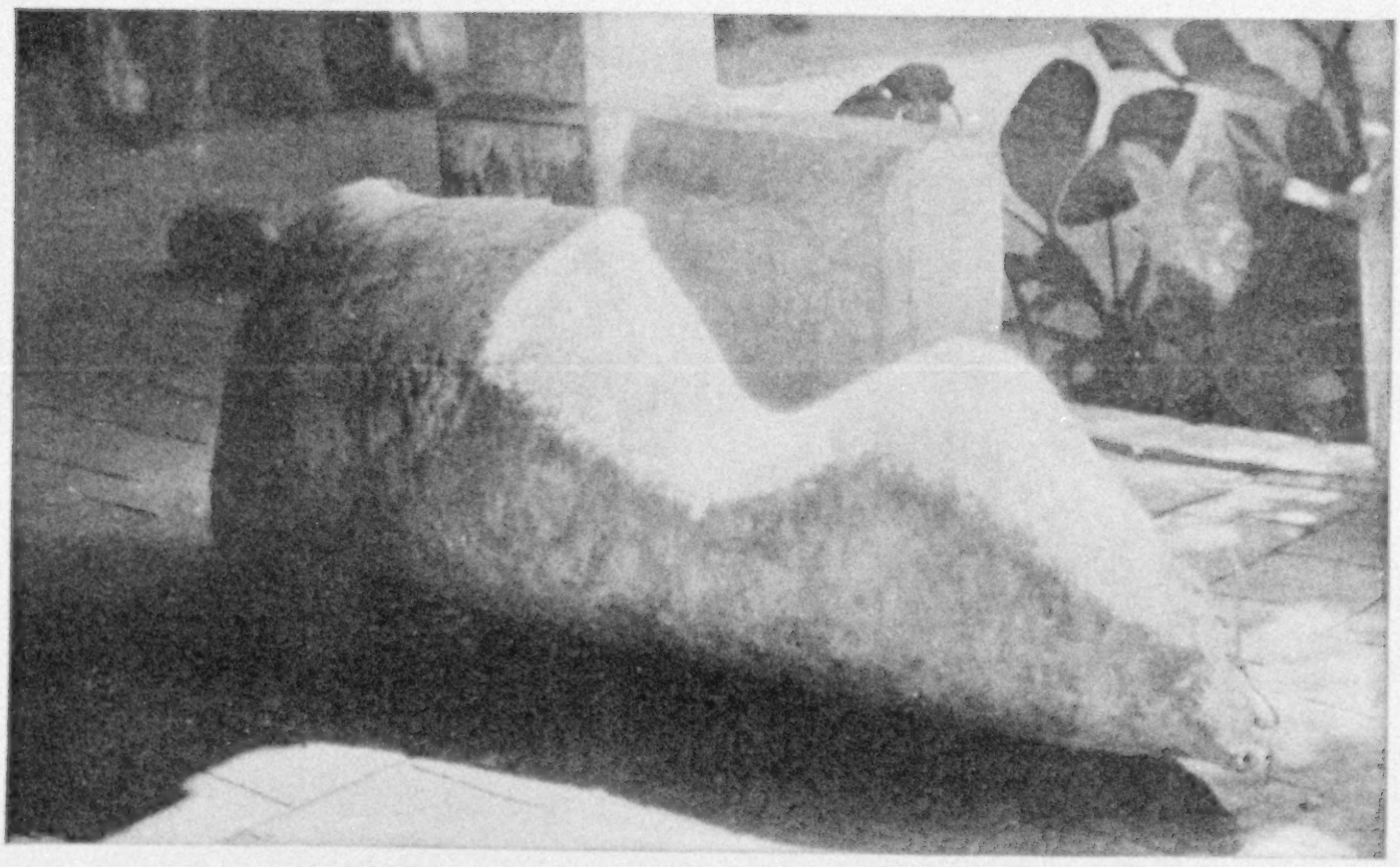
We reached San Geronimo on the evening of December 8. The inhabitants are chiefly Indians, though there are a number of Mexicans and Americans living there who are connected with the Pan-American Railroad, of which this town is the western terminus.

The country about is perfectly flat, with hills visible in the distance in all directions. The type of vegetation is decidedly desertic, the strong winds which blow for the greater part of the time doubtless aiding in accentuating this feature.

The change from the continual climbing and striving to reach the light that is so apparent in the forests a few miles north is very striking. Not that the plants here shun the light, for the typical shape is spreading—a form that secures the greatest isolation—but it is as though there was an effort on the part of each species to get as close to the ground as possible. The advantage gained by shading the roots and resisting the wind is obvious.

Another characteristic that is quite general is the tendency to have finely divided leaves, though the reason for this is by no means so clear and would seem to counteract the shading of the roots, for the leaflets close during the middle of the day, when the sun is brightest. The possession of these characteristics causes a number of only distantly related plants to present an almost uniform appearance. Thus what appeared to be a single species forming a low tree with spreading top

XUM



BEANS PACKED IN A COW-HIDE TO PROTECT THEM FROM GRAIN WEEVILS
(SEE PAGE 309)

and pinnate leaves proved to consist of five different species belonging to at least three genera and two families.

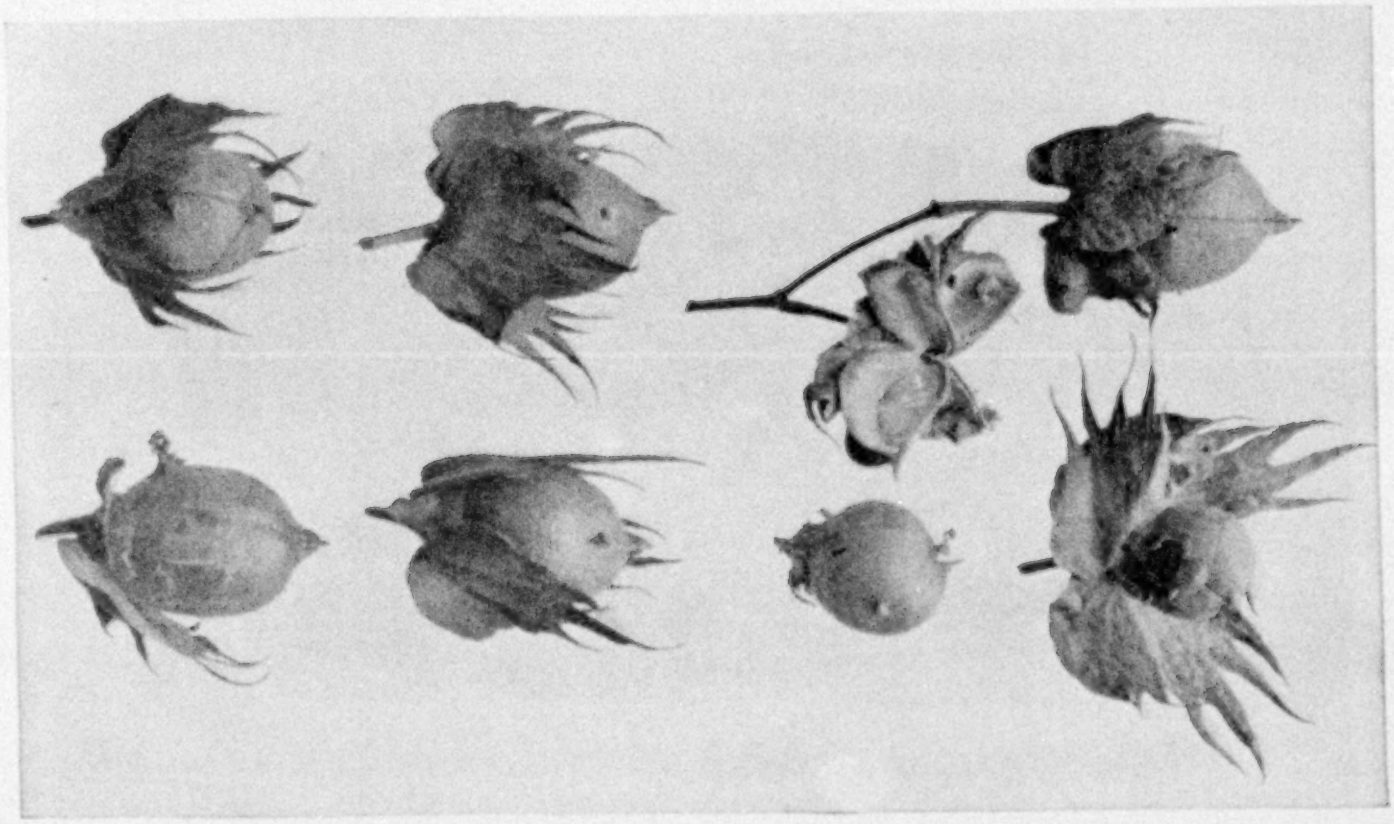
We found that the cotton mill at Providencia is not located on the shortest road between Jalisco (where we left the railway) and Tuxtla, so that our baggage was sent direct to the latter place by ox-cart, while we with two pack animals took the old road which passes through Providencia (see map, p. 316).

The rise from Jalisco is very abrupt. In one or two hours we had entirely left the lowland type of vegetation, and oaks and pines put in an appearance. Before night we had left the oaks, the only trees being pines. We spent the first night at Los Pinos, where we secured several varieties of corn. Los Pinos is at an elevation of about 2,600 feet, and although we found very much higher country farther north we had already crossed the continental divide, which is here close to the Pacific coast.

The next morning we reached the cotton mill at Providencia. This mill, though small, is very complete, much of the cotton being received as seed cotton. About 150 pieces of cotton cloth, each 82½ feet long, are turned out daily. The entire output is sold locally—that is, in Chiapas—this being the only cotton mill in the State. The bulk of the cotton used in this mill is imported from the United States and from Mexico through the port of Acapulco. The local supply averages about 5 tons yearly, but it is the best grade of cotton that they secure.

We were treated with extreme courtesy by the manager of the mill and secured a quantity of cotton seed from the picking of Acala and San Bartolomé, the centers where most of the cotton in this region is grown. Although at an elevation of over 1,000 feet, sugar-cane is successfully cultivated here, the factory turning out both brown sugar and rum for local consumption.

Beyond Santa Lucia the country is very barren. There are long level stretches surrounded by high pinnacles of rock



BOLLS OF "CULLUCHE" COTTON (SLIGHTLY REDUCED).

This cotton protects itself against the boll weevil in most vigorous fashion. As soon as a weevil has deposited an egg inside the cotton boll, the plant manufactures tissue around the egg and smothers it. The buds are protected by a small jumping spider, which weaves a web across the base of the bracts (see pages 310 and 313).

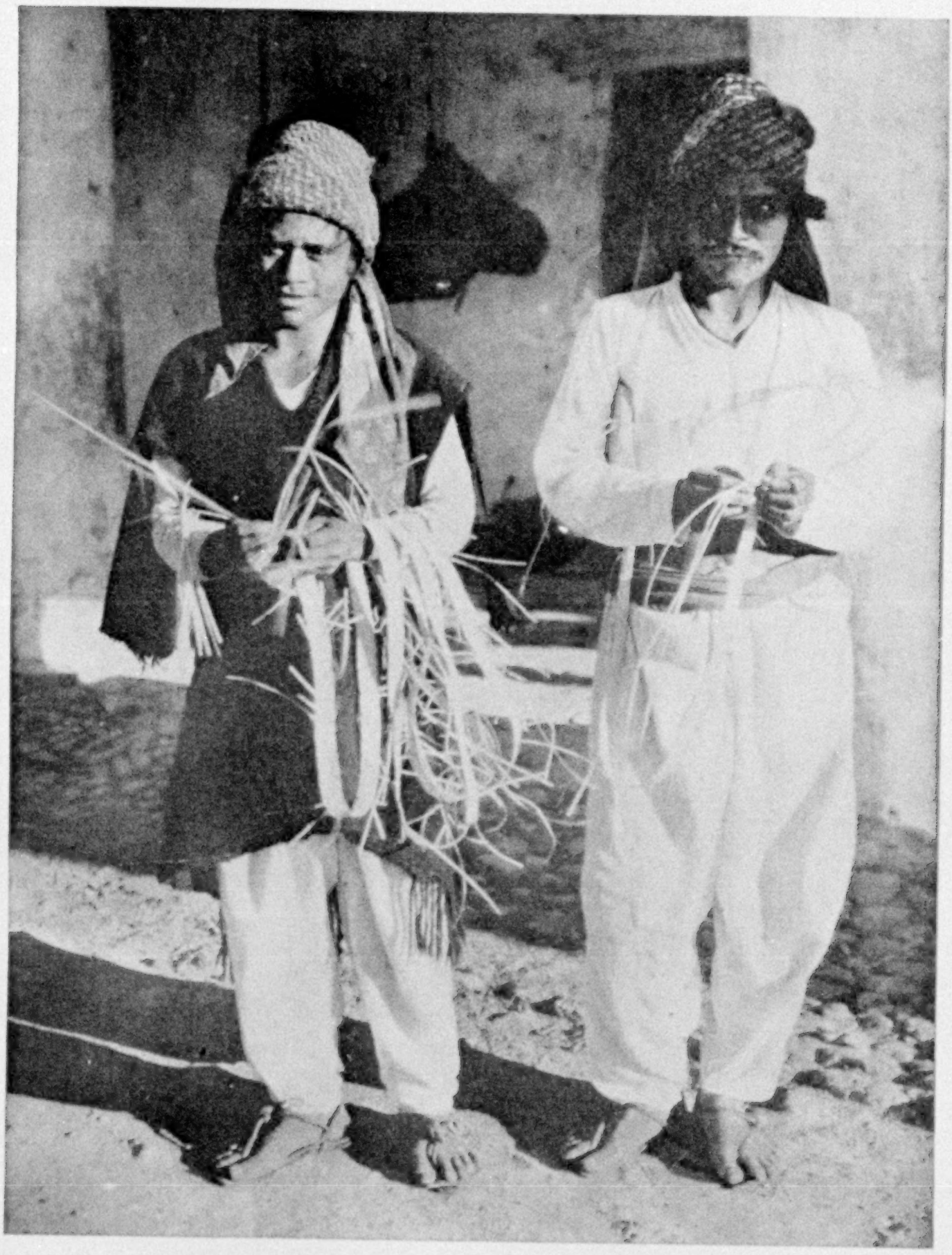
which appear to be limestone. Here logwood is abundant. So far as we could learn, no use is made of this dyewood, and the transportation facilities are probably insufficient to warrant its exportation. The only agricultural operations seen in this part of the country were a few scattered fields of Indian corn and young henequen plantations.

Traveling in this sparsely inhabited region, one always fares well at the haciendas along the road, but in the towns it is difficult to secure any accommodations. There is not sufficient travel to warrant hotels, and the generous hospitality of the *finqueros* is entirely wanting in the towns.

At Cintalapa we learned of a cotton plantation at Rosario which we visited. The way from Cintalapa to Rosario leads through two broad valleys separated by low hills; the same dry-land type of vegetation continued, consisting of fine-leaved legumes, grass, and occasional cacti. Occasional corn fields were the only signs of cultivation. The corn had all been harvested, and the plants showed that they had been doubled and the tops cut for fodder. At Rosario, which is located on similar land, Señor Tirado is growing beans, corn, tobacco, cotton, sugar (with irrigation), and henequen. He also keeps a quantity of cattle and is making cheese. The place is a striking example of what can be done on these dry lands by intelligent management. Señor Tirado gladly gave all information requested and is willing to send seeds to the Department or aid in any way possible.

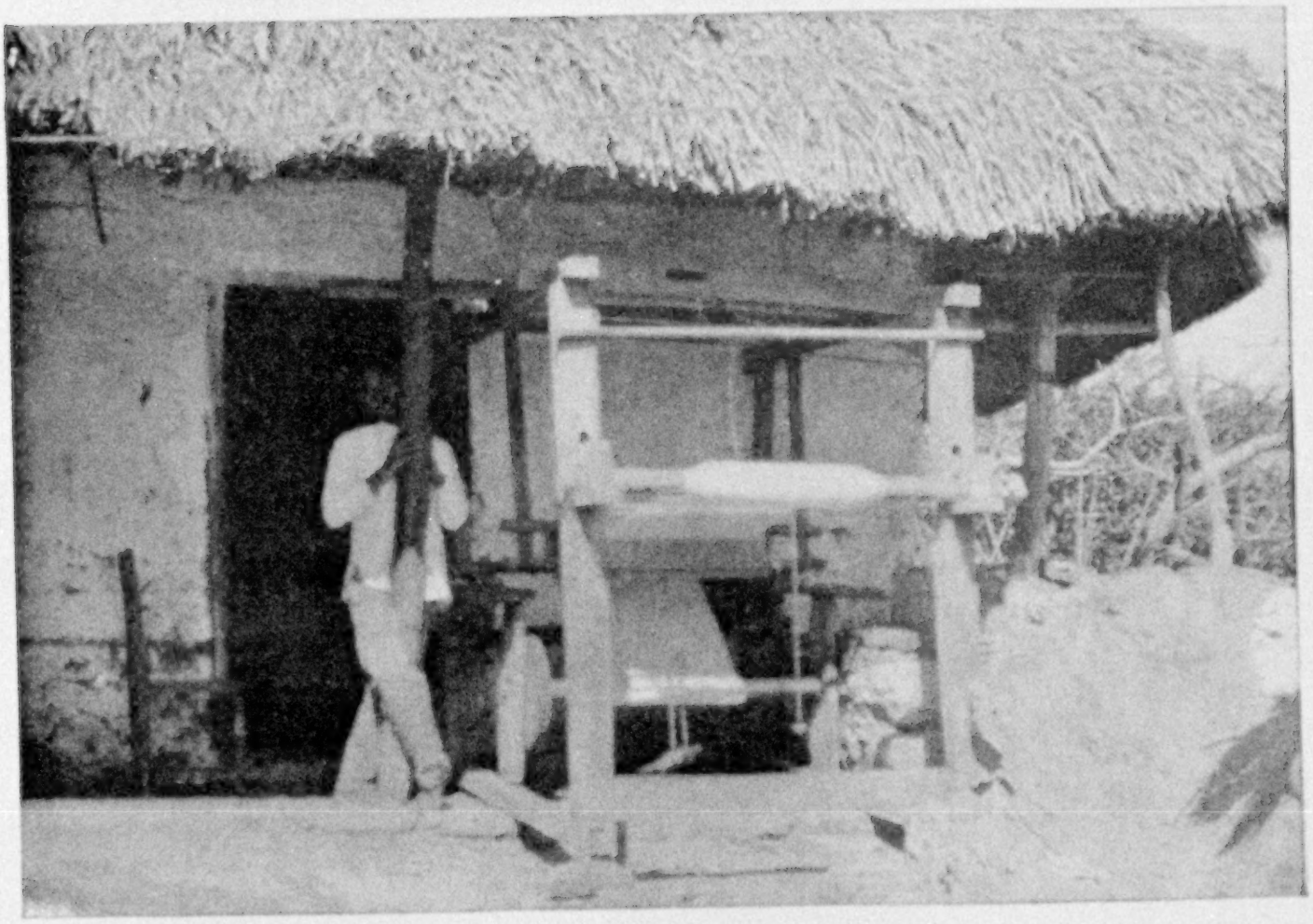
The cotton crop at Rosario had just been harvested, but the plants had not been destroyed, so that we were able to secure data regarding the nature of the variety and its method of culture. The field used this year for cotton was about 20 acres of practically level, sandy ground inclosed by low hills.

XUM



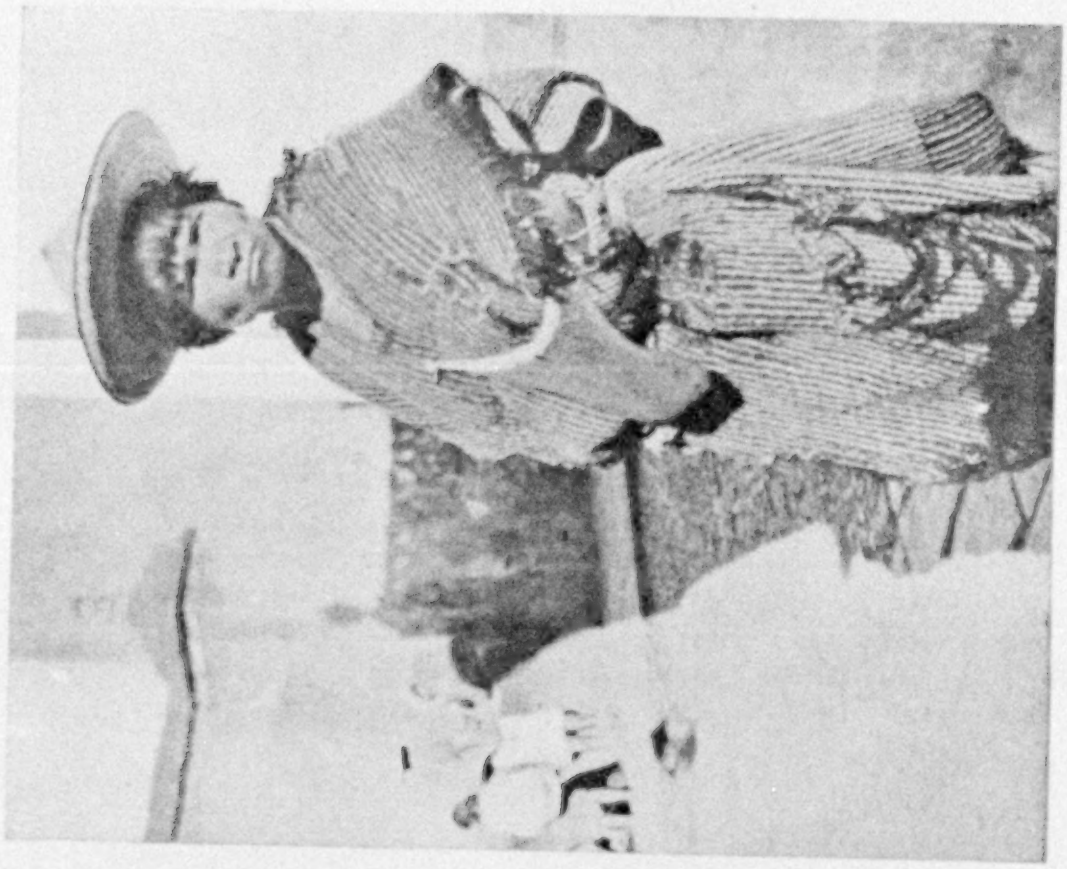
INDIANS WEAVING MATS FROM INODES FIBER: SAN BARTOLOMÉ

The men wear a red cloth, tied like a turban, around the head (see page 315)



WOMAN GINNING COTTON: SAN BARTOLOMÉ

NATIVE COTTON LOOM: SAN BARTOLOMÉ



INDIAN OF SAN BARTOLOMÉ

INDIANS OF SAN CRISTOBAL

INDIAN WOMEN AT THE FOUNTAIN: SAN BARTOLOMÉ

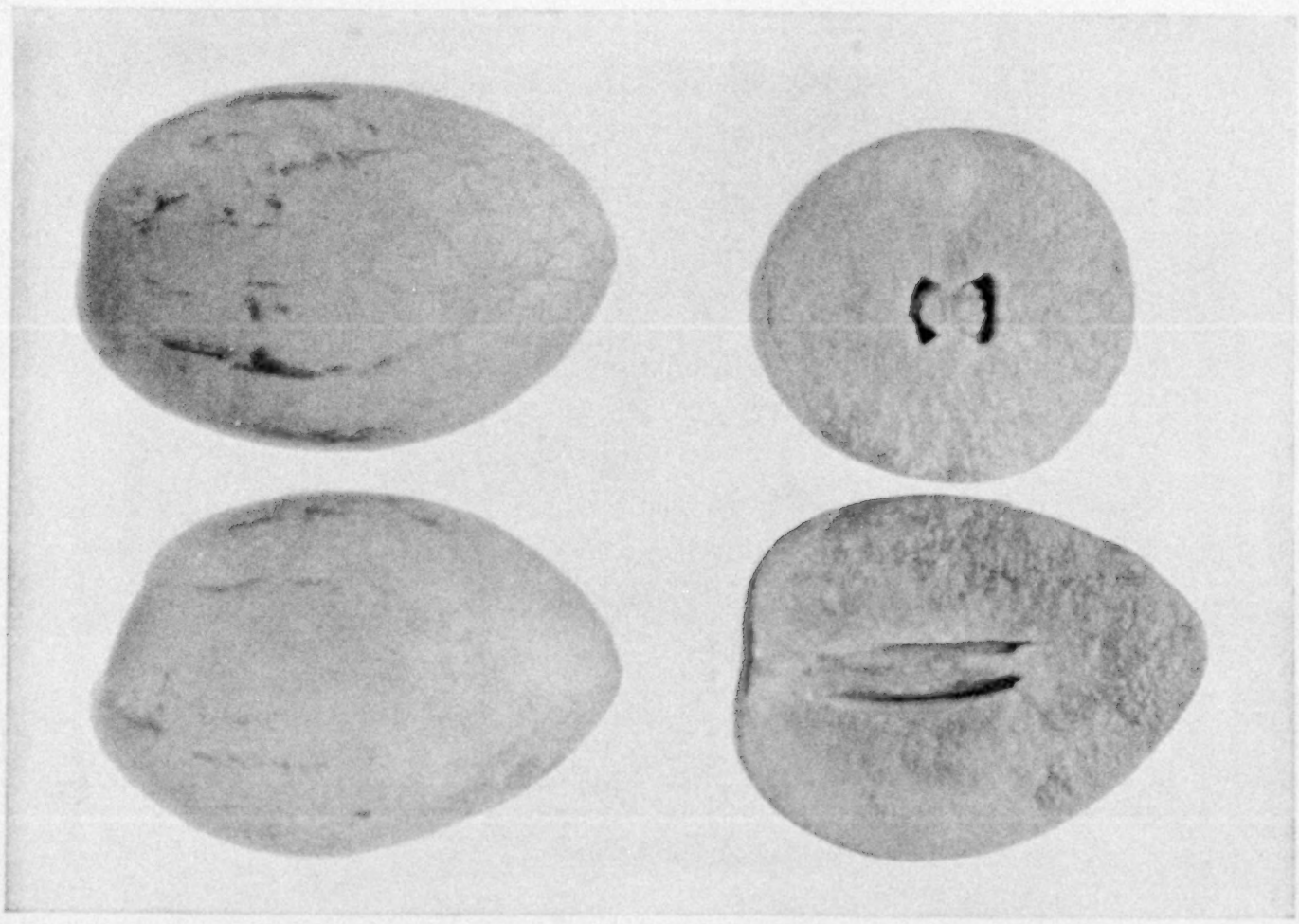
The method here employed for combating the weevil is to plant the cotton only in alternate years. When Señor Tirado began planting cotton, several years ago, four or five other *finqueros* began planting at the same time. All secured fine returns the first year. Contrary to the advice of Señor Tirado, the others planted the following year and the weevils completely destroyed the crop. Señor Tirado waited until the others had planted for three successive years, each time the crop being a complete failure, when all gave it up. He then waited another year and planted again with good results and has secured good crops every alternate year since. The off year he plants corn, beans, tobacco, etc., and gets good use of the land. He naively says that cotton yields so abundantly that one ought to be satisfied with planting every other year.

From Señor Tirado we also obtained five varieties of Indian corn that are admirably adapted to dry conditions. They mature here in from 40 to 60 days.

Grain weevils are a serious pest at Rosario, and Señor Tirado has adopted several ingenious methods to prevent their ravages. He protects beans by storing them in cow-hides, which are sewed up and the seams sealed with lime. He states that they will keep indefinitely in packages of this kind.

A common custom in these regions is to plant a climbing species of bean in the corn fields soon after the corn is planted. The short-season corn matures and is doubled before the beans make much growth, and as soon as the corn is harvested the stalks serve as poles for the beans.

From Rosario we proceeded to Tuxtla, spending several days en route. Here we were introduced to the Governor of Chiapas, who gave us letters of introduction to the various alcaldes and leading men of the towns which we were to visit. He also sent telegraphic orders to these officials that they prepare quarters for us and aid us in every way possible. There is so little travel in this part of the country that without such aid it is often difficult to secure men or animals. We also met a number of influential people who were interested



AN INTERESTING FRUIT FOUND IN THE MARKET OF SAN CRISTOBAL, MEXICO

Although belonging to the Solanaceæ, the odor and taste of this fruit are very similar to that of a fine cantaloupe. The fruits are almost seedless, the flesh firm, of fine texture, and very refreshing.

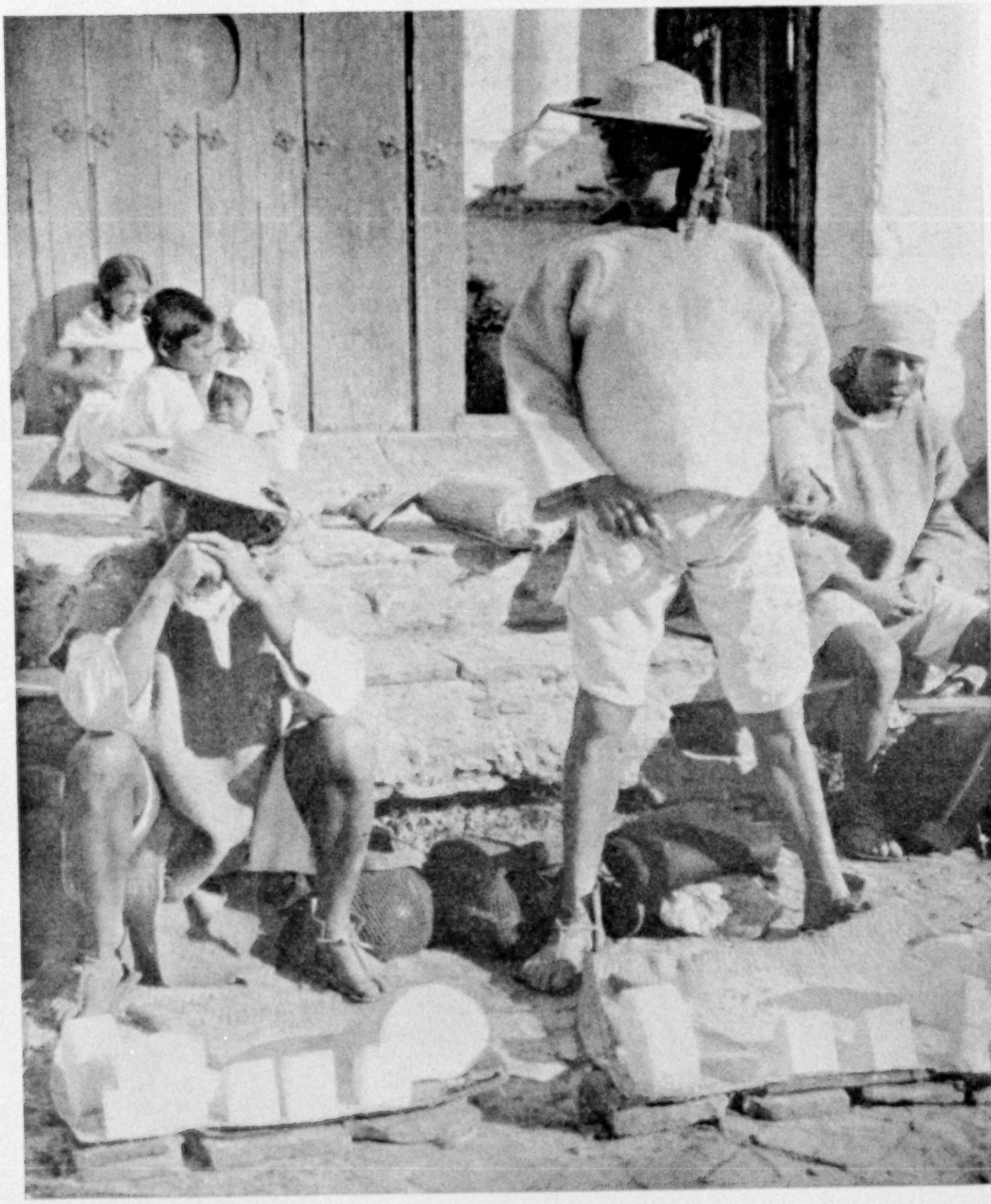
in agriculture and who gave us much valuable information and data from which we could plan our further movements.

In the market at Tuxtla we found a quantity of cotton said to have come from Acala. The bolls were exceptionally large, running 38 to the pound.

Inquiry about the town also led to the discovery of a very interesting small-bolled cotton, known here as "culluche." The variety is without economic importance, but it shows such weevil resistance that it seemed worthy of careful study. The plants are perennial, those seen being about 10 feet high with trunks about 3 inches in diameter. They were heavily loaded with very small bolls and still flowering, the lint being short and brown in color.

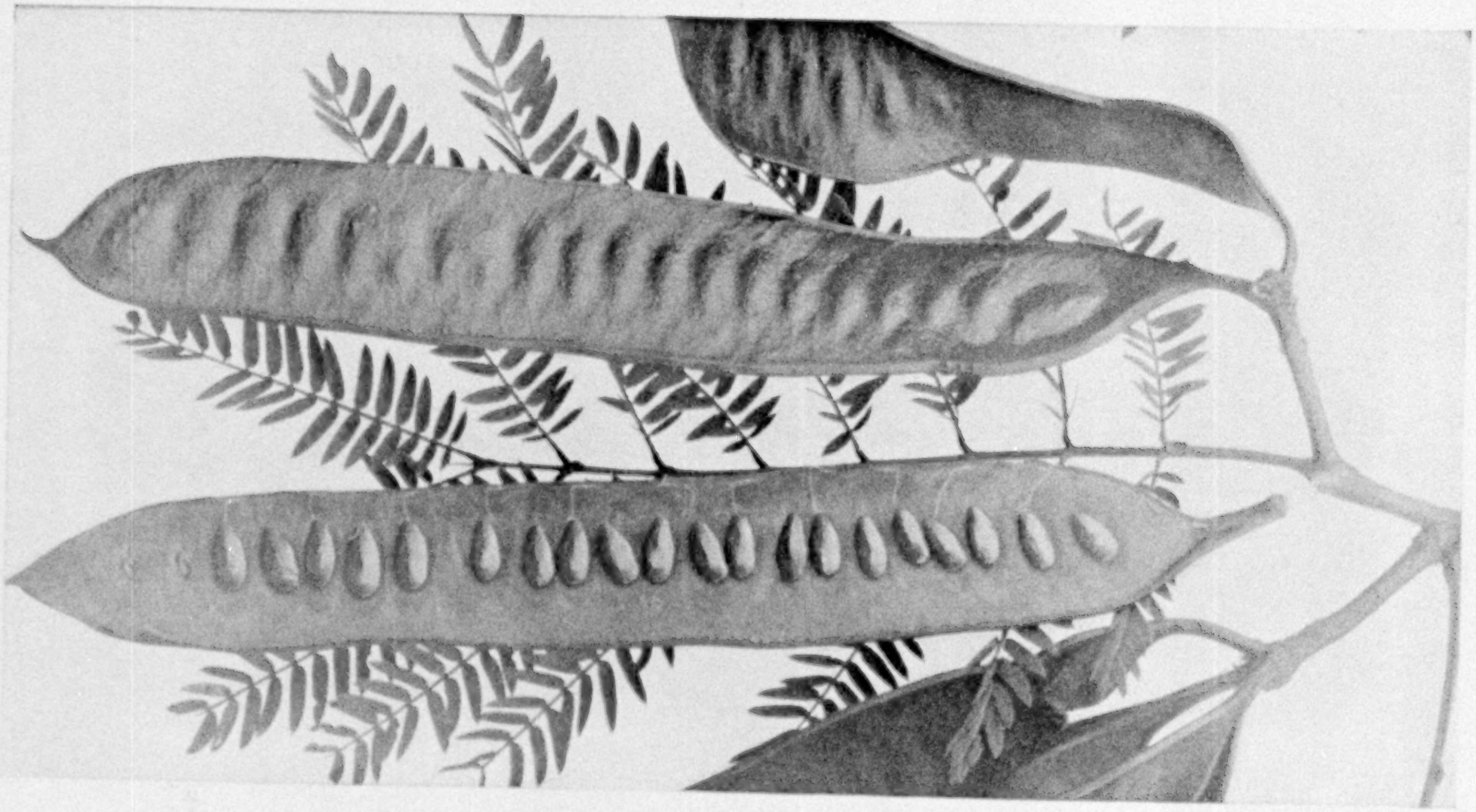
Weevils were present in large numbers, but were doing comparatively little damage. The bolls are protected by proliferation much more completely than in any cotton thus far studied. Hardly a single boll could be found which had not been punctured, but in all the bolls opened we could not find a single live larva. In fact the proliferation was so complete that the bolls were hardly deformed, although as many as 7 or 8 eggs had been laid in a single boll. Proliferating tissue had formed to such an extent that it was forced out through the opening and dried as a coiled mass on the outside of the boll. In many cases these coiled masses, if straightened out, would be at least two inches long (see page 305).

Curiously enough the buds of this cotton showed no proliferation whatever. They were protected, however, in a very interesting manner. The bracts were tightly closed except at the base, where there was a small aperture, and in nearly



MARKET SCENE AT SAN CRISTOBAL

The streamers on the man's hat indicate he is unmarried and has a sweetheart (see page 315)



THE LEUCÆNA SEED

A food of considerable importance among the Indians of southern Mexico is the seed of several species of *Leucæna* that are eaten raw. The custom is widespread. Specimens were found offered for sale in the market of Mexico City, Oaxaca, and in all the towns of Chiapas that we visited. At least four species were collected. These seeds did not appeal to our palates, but the Indians appear to be very fond of them.

every case examined this opening was closed by the web of a small jumping spider (*Aysha minuta*). The protection thus afforded, though by no means so complete as in the case of the bolls, is still very effective. Practically the only time that the weevils can gain access to the bud is just as the flower is opening the bracts. The only use that is made of this cotton here is in the decoration of the altars which every house contains at Christmas time.

Although the country from Tuxtla to Chiapas showed every indication of being subject to severe drought, almost all the land is under cultivation. Corn and henequen are the principal crops. This district is very densely populated, the houses, each in a small yard, being so thick along the road that the impression is given of a continuous town all the way from Chiapas to Rivera de Cupia. At this point the road leaves the Chiapas River, and the country gradually rises and becomes still drier.

Near El Faro the land was more open, with sufficient grass to support numbers of cattle, the raising of which is the principal industry. It being Christmas eve, there was a demonstration in the church at the hacienda, after which, amid fireworks and the beating of drums, an image of the Child was carried to the bank of the river, where the entire population remained until daybreak.

The town of San Bartolomé is old and very picturesque. The buildings are of stone, with tile or thatched roofs, and the streets are paved with large flat stones. All the vacant spaces between the houses are filled with high stone walls, so that the streets are narrow alleys of stone.

In the plaza are the ruins of an old church, the nave of which has been entirely destroyed by earthquakes, leaving only the towers. There is a large Indian population in and about the town who speak the Tzotzil language.

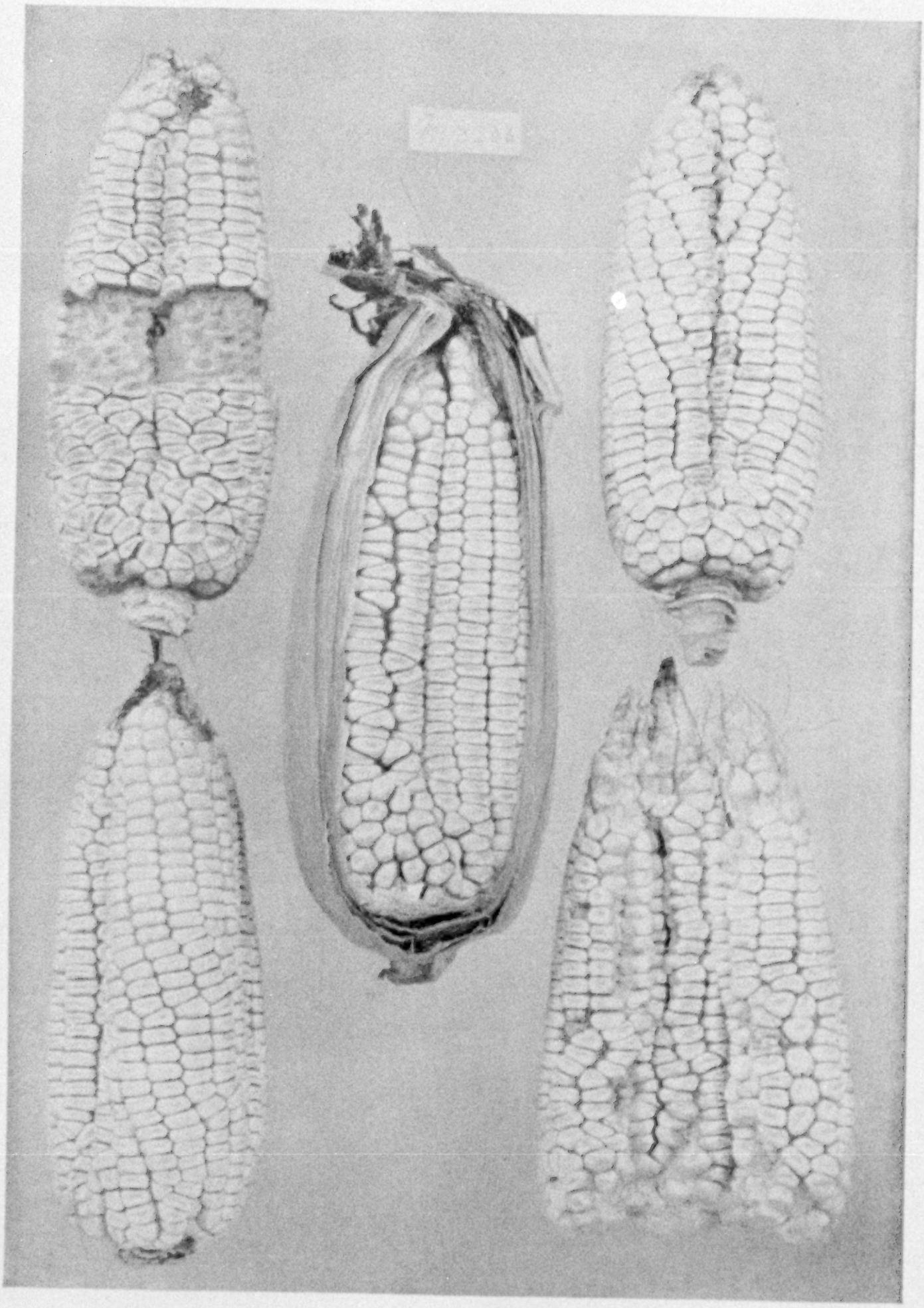
Cotton is grown by both the Indians and the Mexicans, and is planted only in alternate years. This custom is probably an aboriginal one and the Mexicans copy it from the Indians. No one could be found who had the faintest idea as to why the cotton failed to do well if planted every year. It is another instance of primitive people being right in practice without knowing the reason why. Unfortunately this was the year in which no cotton was planted, and the only place where cotton was being grown at the time of our visit was at San Sebastian, a finca located about three leagues southeast of San Bartolomé.

Here the corn is planted about the middle of May, the cotton in August, and the beans in September—all in the same field. The corn is doubled in November or early December and remains in this condition until after the cotton is picked, so that the harvesting of the corn may not injure the cotton.

Our visit was well timed for the study of this cotton, as the bolls were just beginning to open. Weevils were present in great abundance on all the cotton bushes, which were five or six feet high, but it was nevertheless apparent that a good crop would be secured. The bulk of the crop is set on the long basal branches close to the ground, where the bolls are practically exempt from the attacks of the weevils.

There could be little doubt that the plant protected itself from the weevils by bearing its crop close to the ground, as hardly a punctured square or boll could be found except on the upper part of the plant. The crop was said to be not unusually large, but it would compare very favorably with anything I have seen in the United States. We were told that in ordinary years it is necessary to pick 50 yards of a row in order to secure one arroba, or 25 pounds, of seed cotton. As the cotton is planted one yard each way, this would amount to 2,420 pounds seed cotton per acre, or about 800 pounds of lint. This seems an incredibly large yield for land that was also producing a crop of corn and beans, but from the appearance of the plants I am inclined to believe that it is not far from right. The region toward the river, where cotton is grown only in alternate years, is said to produce even larger crops.

The yield of corn at San Sebastian must have been correspondingly large. The hills were planted at the same dis-



THE FAMOUS DOUBLE-EARED CORN OF TUXTLA (SEE PAGE 319)

tance as the cotton, with four or five stalks in each hill. Very few sterile stalks could be found, and most of the stalks bore two or three well formed though rather small ears. The plants before being doubled must have been about 8 feet high.

The greater part of the inhabitants of this place are pure Indian. The men have straight, coarse, black hair reaching almost to their shoulders. The lips are thick, but otherwise the features are quite like those of the Indians of Guatemala. They wear a red cloth, tied like a turban, about the head, a short "guipil" or shirt like that of the women, and full white trousers that are usually tied in at the bottom, making them look like Dutch trousers. The women are very short and well formed. They wear a short "guipil," usually white or with very little color, and a dark-blue cloth wrapped around the hips. Their chief decoration takes the form of embroidery of this blue cloth, which they do in silk of various colors. Some of the more elaborate cloths are valued as high as $10 or $12 gold.

From San Bartolomé the road passes around the base of the mountain on which the town is located, and at a distance of about one league enters the oak forest. Soon after this the pines appear and the characteristic plants of the lower levels disappear.

Our course led up the valley of a small river, along the banks of which the vegetation was more luxuriant, mahogany and cedar trees being not uncommon. At an elevation of 4,000 feet, the country became more open and *Brahea* palms appeared. Our road continued to rise until it crossed a high ridge amid magnificent pines and oaks, and the town of Teopisco came into view in a flat valley entirely surrounded by high mountains. The elevation of the town is 5,300 feet, and the night before our arrival there had been a hard frost and nearly all the vegetation was black. We spent a night at Teopisco, and in the morning the white frost could again be seen on the ground and roofs.

We left for San Cristobal early in the morning of December 31. The road continued to ascend and for nearly the whole day we traveled through magnificent forests of pine and oak. The trees were very large, with little or no undergrowth, the absence of which is probably due to the sheep, which are pastured in the forest in large numbers. Toward night we crossed a high ridge, probably 7,000 feet, and descended to the valley in which San Cristobal is located.

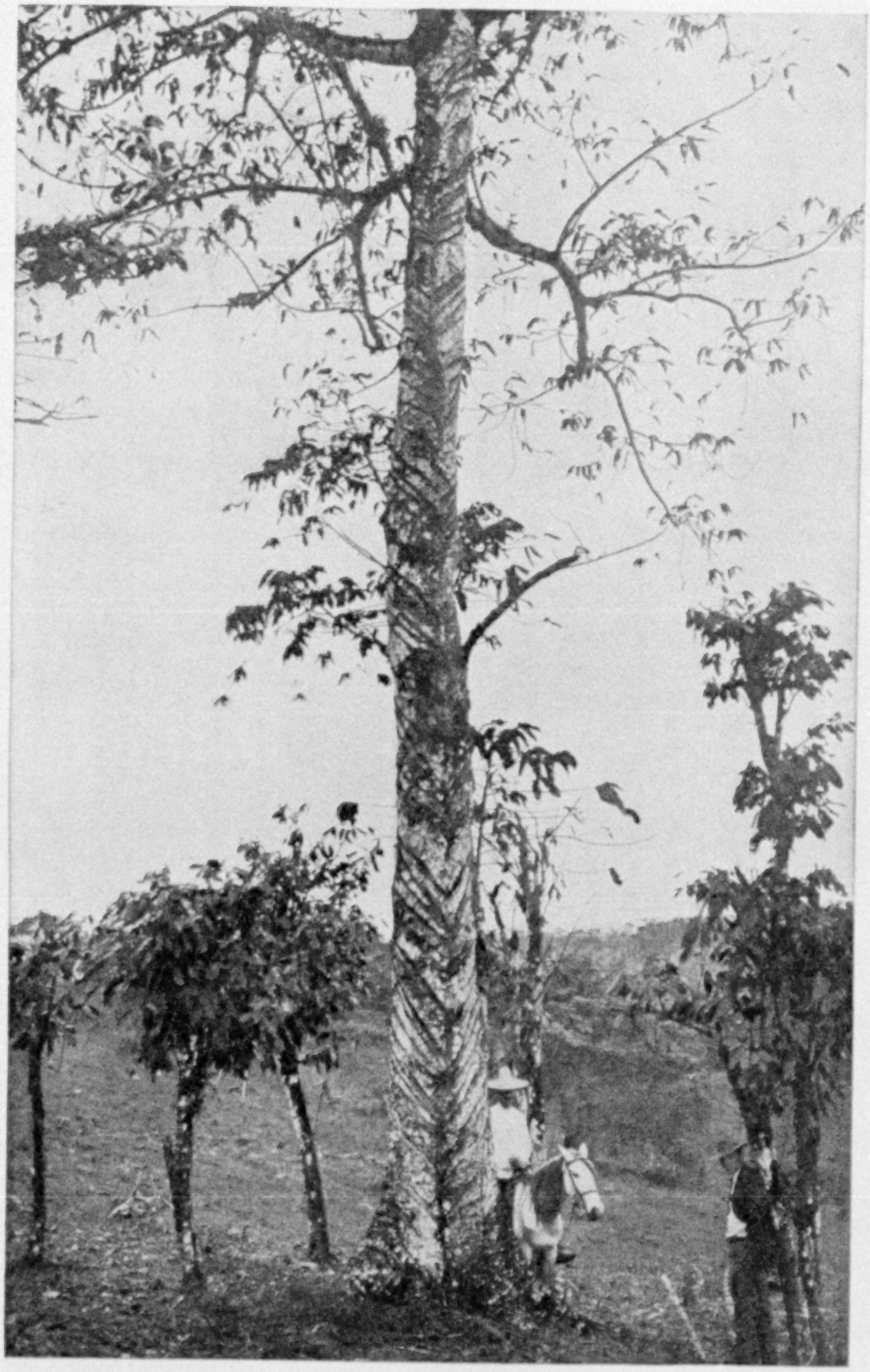
San Cristobal, like Bartolomé, was at one time the capital of the State, but its inaccessibility was sufficient reason for removing the seat of government. It is more closely associated with the civilization of the western part of Guatemala than with other parts of the State of Chiapas. Frost occurred every night of our stay and is usual at this time of year. Here we secured seed of a wheat which is cultivated on the very steep slopes near the tops of the mountains about the town, in the hope that the variety might be of some historic interest, this region being so isolated that the variety is probably one that has been grown here from very remote times.

Seeds of a fine avocado were secured. As this entire region is subject to frost, snow sometimes falling at San Cristobal, the variety will probably prove to be resistant to cold. The exact locality from which the fruit came could not be ascertained, but trees were seen which had withstood the frost better than orange trees and where most of the vegetation was killed back.

There is a considerable Indian population about San Cristobal. They dress in coarse woolen blankets with a hole for the head, or in short woolen shirts. They wear very low-crowned straw hats decorated with ribbons, which give them a very ludicrous appearance. The streamers on the hats indicate that the man is unmarried and has a sweetheart.

We started on our return for Tuxtla on the morning of January 2, taking the road that leads through Ixtapa.

The road descends steadily. For a long distance practically the only trees are the oaks, and for three or four leagues these have been pollarded to secure fire-wood



LARGE CASTILLA RUBBER TREE: CHIAPAS (SEE PAGE 320)

for San Cristobal, which has caused the trees to assume grotesque, dwarfed forms. Effects of frost were evident until we descended to about 4,000 feet. A fine feature of this day's trip was a stretch where the road followed the bank of the Osumatinta River through a gorge, the sides of which ranged between 500 and 1,000 feet high. The side of the gorge opposite the road was covered with a rank growth of ferns and other vegetation, rare in these regions.

The oaks around Ixtapa have also been pollarded to furnish fuel for the town. For miles about all the towns in this region every piece of available wood has been removed and fuel has often to be carried a distance of 10 or 12 miles on the backs of Indians. As soon as the higher ridge is reached the whole valley of the Grijalva is visible from the top of an almost perpendicular cliff about 2,000 feet high. The view is more like that from a balloon than anything we had ever seen. The descent from here is constant and a very severe strain on the ears.

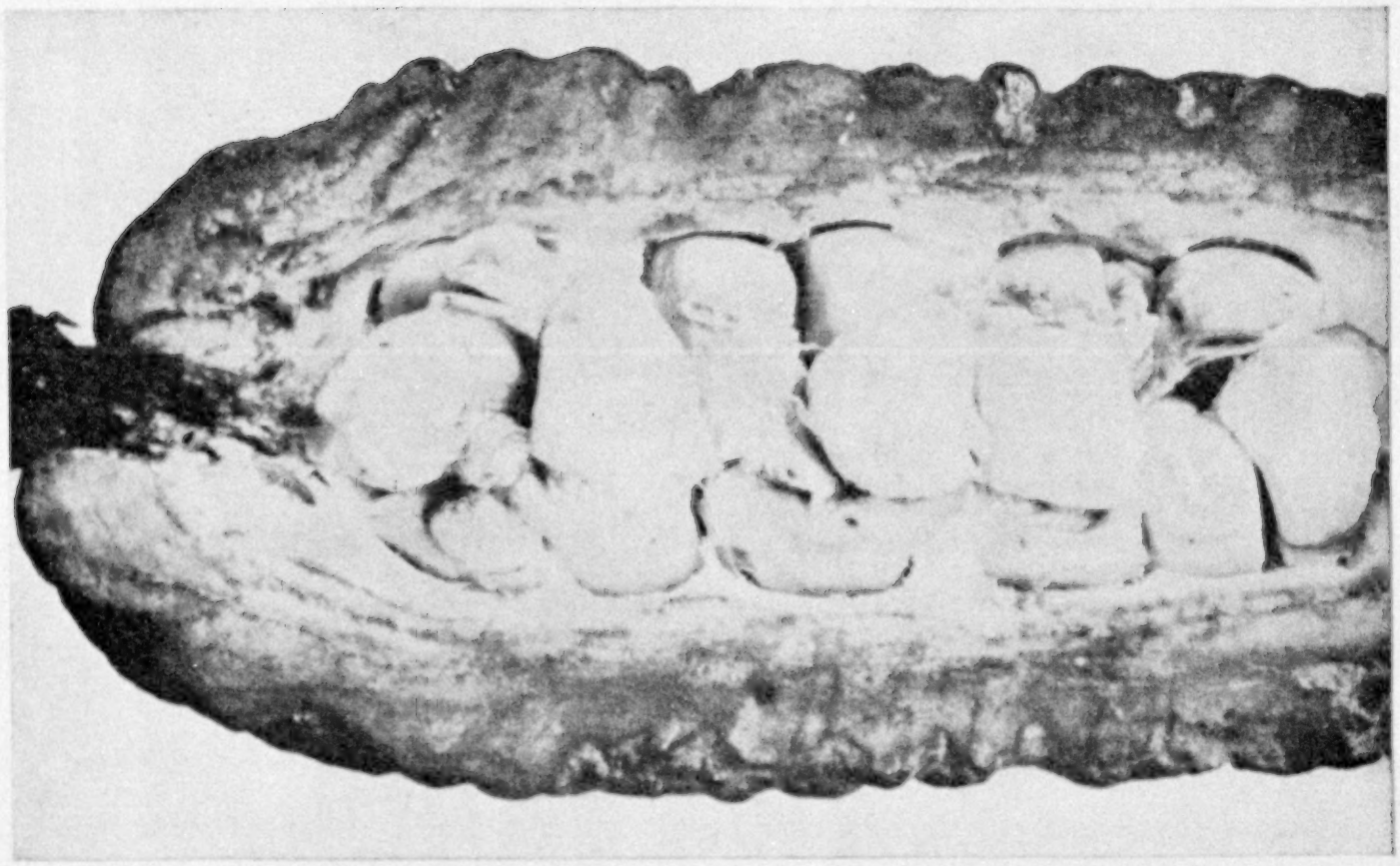
SKETCH MAP OF SOUTHERN MEXICO, SHOWING THE ROUTE OF MESSRS. COLLINS AND DOYLE

While in Tuxtla we secured samples of a curious double-eared corn that was at first thought to be merely an abnormality. We soon found these ears in such quantities, however, as to lend color to the statements of the natives that this was a real variety that always came true to seed. It is certainly not a case of simple fasciation, for the ears are not grown together, but have branched just inside the husk. Kernels are borne entirely around each of the branches. We secured specimens with three branches, and four are said to be not uncommon. Aside from the peculiar form of the ears, this corn is a type distinct from anything else found at Tuxtla, and every ear that we saw had at least two branches. It is one of the most popular varieties here and is said to yield very good crops.

As an evidence of the isolation of Tuxtla and to show the extent to which primitive customs still prevail, the fact may be mentioned that cacao is still used as money in the market, a custom that was general in many parts of tropical America at the time of the discovery. A common expression for cheap articles in the market is that they sell so many for a "cinco." This originally meant 5 cacao beans, but to allow for the fluctuating value of the cacao a "cinco" actually consists of from 2 to 5 cacao seeds, but the ratio will be uniform throughout the

TRUNK OF CACAO (CHOCOLATE) TREE: PICHUCALCO

Showing the peculiar position in which the fruit grows. Cacao beans are still used as money at Tuxtla



AN OPENED POD OF CACAO (SLIGHTLY REDUCED)

Cacao was appreciated by the Mexicans long before the discovery of America. Prescott writes that the Emperor Montezuma was "exceedingly fond of it, . . . no less than 50 pitchers being prepared for his own daily consumption; 2,000 more were allowed for that of his household." Seventy-three per cent of the cacao used by the world comes from tropical America and the West Indies (Ecuador, Brazil, Trinidad, Santo Domingo, and Venezuela); 23 per cent from Africa (principally Portuguese East Africa), and the rest from Ceylon and the Dutch East Indies.

market. In making a purchase the necessary question is, "Cuanto es cinco?" (How many are five?) The money value of the "cinco" is about ½ cent, Mexican.

A drink that is common here, and one that we found very useful in making long trips where there was little food available, is "tascalate." It is made of parched corn, ground and mixed with ground cacao and almonds, and is conveniently carried in the form of a powder. It is only necessary to add sugar and a little water to make a pleasant and very nourishing drink.

Soon after passing Santa Rita the ascent becomes more rapid and the pines and oaks become larger. A broad plateau is soon reached, covered with a moist forest, that reminds one strongly of the forests of our northern States, except that everything is on a larger scale. The oaks are more like the species at home, and sweet-gum trees that appear identical with those at home are not uncommon. Many of the oaks and pines are 3 feet in diameter and very tall. As we crossed the edge of this plateau and descended into the humid tropics to Pantepec, the transition was very abrupt; tree ferns, Musaceæ, and Zingiberaceæ suddenly appeared in abundance.

The town of Pantepec has an elevation of about 5,000 feet. The inhabitants are Indians, but speak a dialect distinct from the Indians of Tuxtla. We found but two people in the entire town that could speak Spanish, yet they are all devout Catholics.

Pichucalco, two days by trail from Pantepec, is a rabbling town that presents a very striking appearance from the fact that nearly all the houses are painted

a bright blue. It is of considerable importance as a center of cacao and rubber growing, but is isolated and seldom visited. The usual means of communication with the outside world is to the north instead of by the route over which we came, but even in this direction it is necessary to make a three or four days' journey in a dug-out canoe from San Juan Bautista in order to reach the town. In early Spanish times Pichucalco was connected with San Cristobal and the other towns to the south by a paved road, the remains of which can still be seen.

The rubber plantations here are very old, the trees having been first planted as shade to cacao. In making experimental tappings of a considerable number of trees we were impressed with the great difference of yield between apparently identical trees that were growing side by side, which proves conclusively that all estimates of yield based on the tapping of a small number of trees are entirely worthless. At the finca Concepcion, about three leagues from Pichucalco, we found rubber trees measuring over 9 feet in circumference at 5 feet from the ground. These trees were estimated to be at least 50 years old.

From experimental tappings it was estimated that the tree shown on page 316 should yield at least 12 pounds, and the owner of the finca stated that about that amount had been taken from this tree at former tappings. The trees are tapped to a great height, the "uleros" ascending by means of climbers.

Our experimental tappings at Coahuila disclosed the important fact that the trees do not recover from the effects of tapping with anything like the rapidity that has been supposed. An old tree perhaps 40 years of age was selected. It had been tapped a number of times and always on the same side, the last tapping having been made about a year before our visit. Cuts were made with a 2-inch chisel and it was found that on the side which had been previously tapped hardly a trace of latex could be secured, while on the opposite side on clean bark the flow was enormous, 80 cc. of latex being secured from a single 2-inch cut. With cultivated trees the yield cannot be expected to keep up after the first two or three tappings, even if these are deferred until the trees are 10 or 12 years old.

No plantation devoted exclusively to the growing of rubber has yet proved to be a commercial success, but the output of cultivated rubber from southern Mexico is rapidly increasing.

The cacao at Coahuila produces the largest pods that we have ever seen. They are all of the white-seeded type; but, unlike most of the white-seeded cacaos, the pods have very thick shells; the seeds are large with an unusual amount of pulp.

The trees are well fruited and the pods are for the most part borne close to the ground. The crop is almost continuous from November to June, although there are three chief pickings. The seeds are unfermented and sell for 50 cents, Mexican, per pound at Pichucalco.

As soon as the seeds are removed from the pods they are washed by placing them in shallow baskets partly submerged in water and rubbing them against the bottom and sides of the baskets, forcing the pulp through the meshes. The seeds are then sun-dried, the quicker the better, it is thought. This unfermented product would not command a high price in the European or American markets, but it is said that the Mexicans do not demand a fermented bean. The price which they get would seem to make suggestions for improvement superfluous.

From a few miles below Pichucalco to within a few miles of San Juan Bautista the banks of the river are almost continuous cacao plantations, a great part of which is shaded with rubber.

About 1,500 tons of cacao pass through San Juan Bautista annually, valued at about $1,250,000. In spite of the enormous amount of cacao produced in Mexico and an import duty of 30 cents per kilo, cacao is still imported from Guayaquil. In the fine cacao lands above San Juan Bautista the growing of this commodity is the most lucrative agricultural operation with which we are familiar.

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Each bond has attached thereto small interest certificates, commonly known as "coupons," which are usually payable semi-annually. For example, the coupons attached to a $1,000 5% bond would represent $25.00 each, or the interest on the bond for six months. As the coupons become due they are payable to bearer at the fiscal agency of the issuing company.

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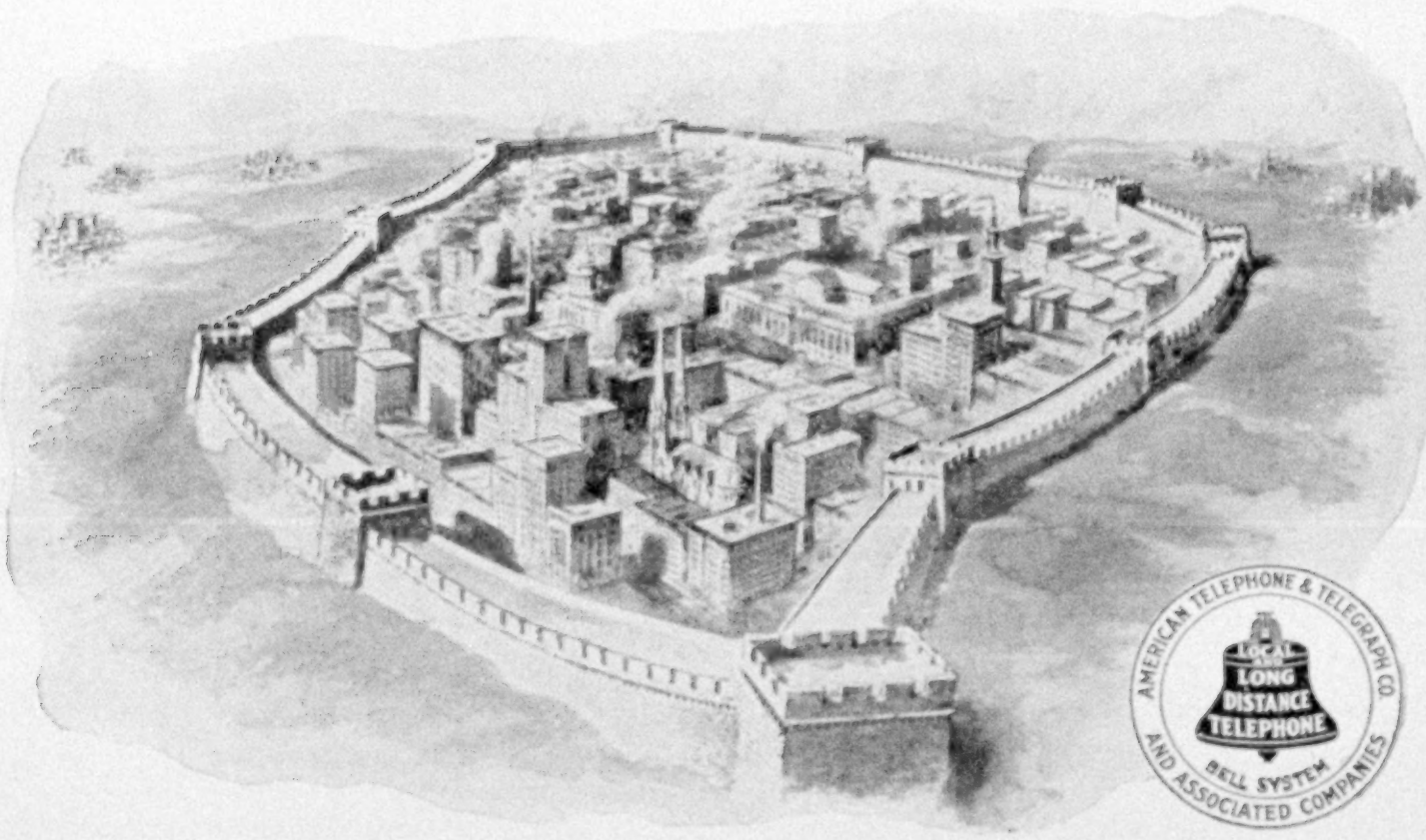

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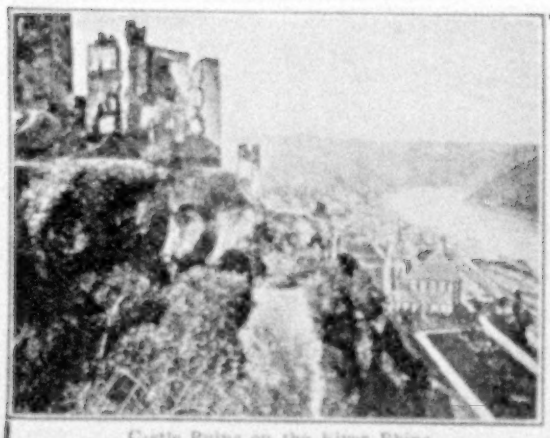

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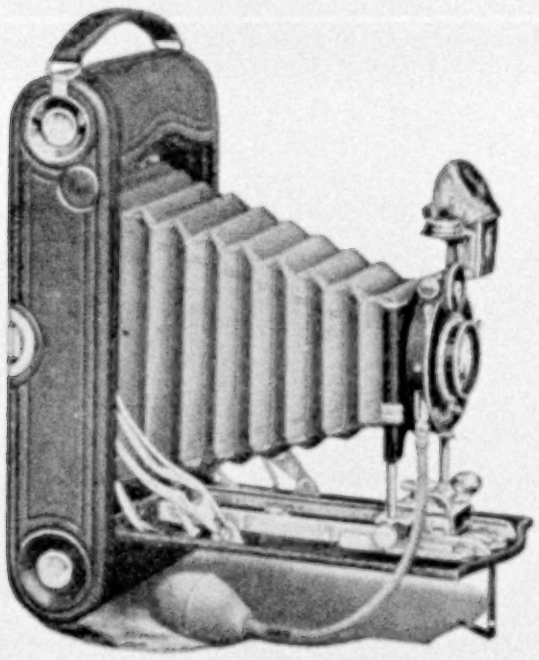

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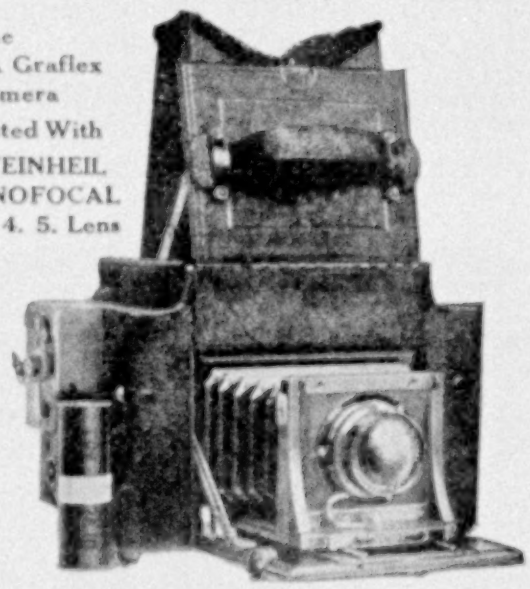

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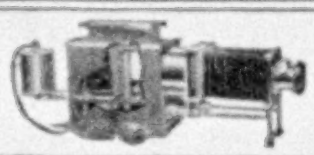

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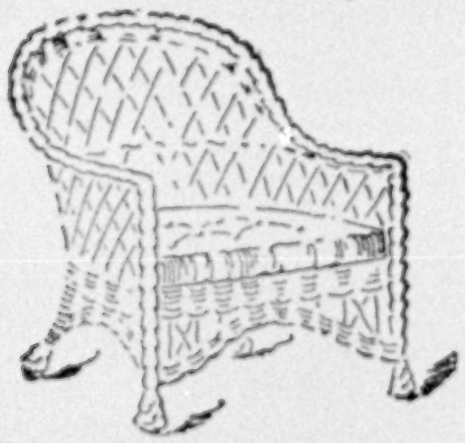

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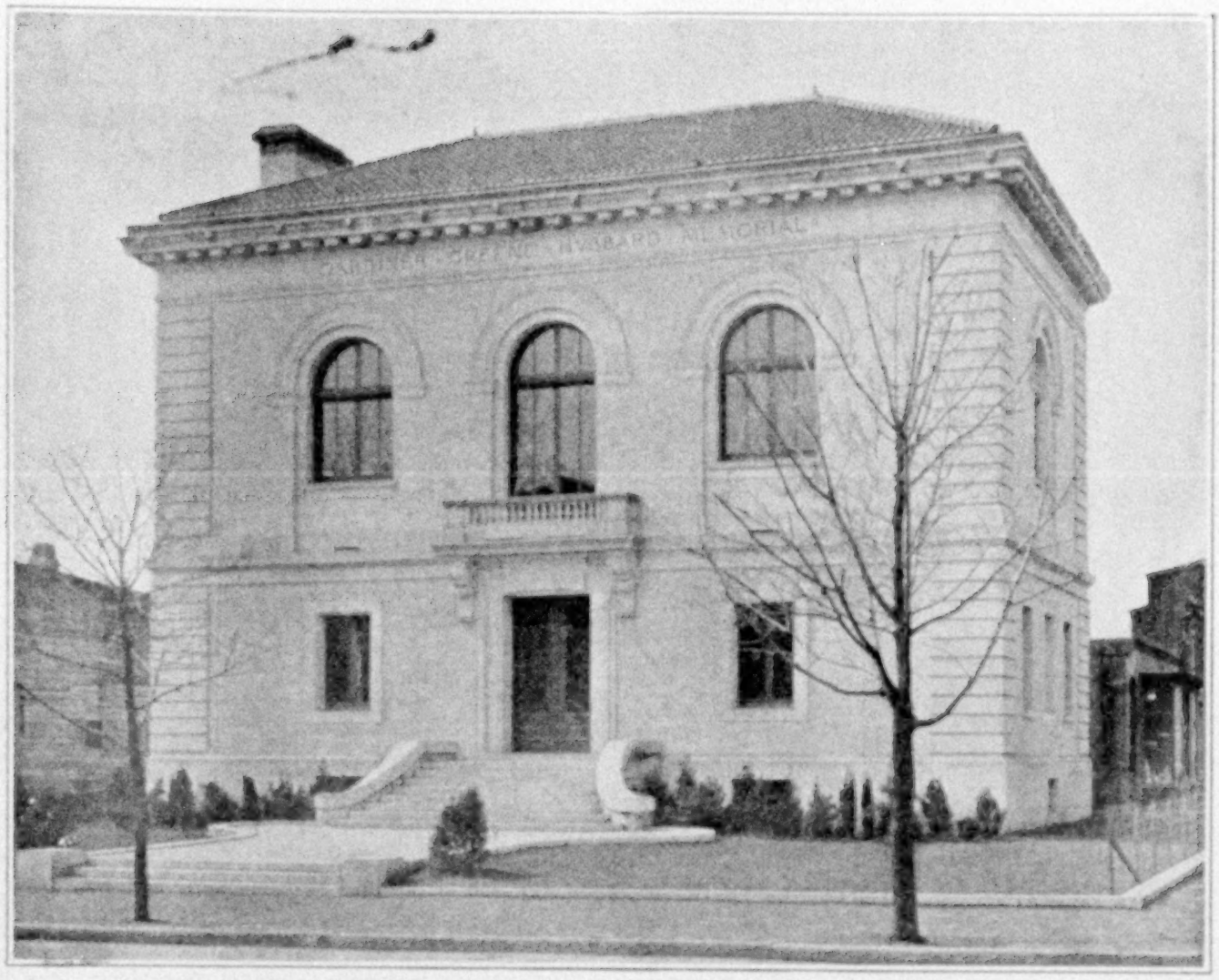

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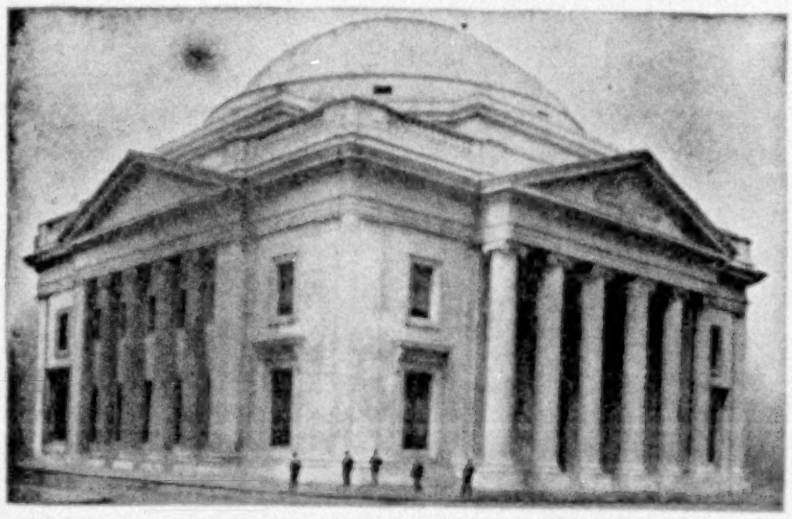

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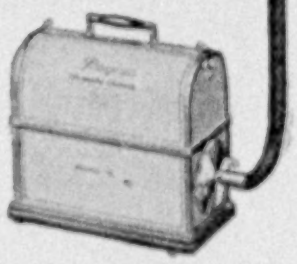

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